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ABSTRACT

This report examines key questions related to the provision of educational opportunities by community colleges to those who are able to benefit from the experience. Chapter I discusses the different meanings of educational access and explains how different implications for public policy stem from various definitions and standards. Chapter II presents information on the extent to which community college access has been achieved in terms of fulfilled aspirations, expectations, enrollments, and student costs. In Chapter III, the limits of student access are explored in the context of financial constraints and conflicting needs, the cost and effectiveness of programs, and the effects of various policy and non-policy factors on access. Chapter IV then looks at community college practices that influence educational access and suggests that colleges can do much to promote educational opportunities for students. Chapter V discusses the likely importance of access in the 1980s, identifying the conventional arguments for continuing various educational programs and outlining the changing emphasis of policy makers. After a summary of findings and observations in chapter VI, chapter VII presents the main conclusions and the policy implications of the report. Appendices include a discussion of the determinants of community college attendance and tables illustrating student demographics and costs. (HB)

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A NEW LOOK AT COMMUNITY COLLEGE ACCESS

By

William Hyde

March 31, 1982

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ACKNOWLEDGMENTS

This report is based upon my work during the last two and one-half years under a contract from the National Institute of Education. The purpose was to examine finance problems facing community colleges and the impact these problems will have on students and prospective students, especially nontraditional students, often served by community colleges. For a project with such a broad scope extending over several years, I was fortunate to have Lauren Weisberg as the project officer for this study. Her flexibility and persistence were instrumental in the evolution of this report.

The report was completed in large part because of the assistance of scores of individuals who provided advice, information and data. Many educators, policy makers and administrators in the 50 states took time to fill out surveys and to interview with project staff. The state directors of community and junior colleges and the state directors of state grant and loan programs completed lengthy surveys. In California, Colorado, Florida, New York and Texas state legislators, budget officers, state higher education officials and a full range of institutional administrators -- including presidents, deans, business officers and student financial aid directors -- spent hours talking with staff and commenting on various draft reports. A list of the individuals who provided information would probably exceed two hundred.

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INTRODUCTION

For the past 20 to 25 years the provision of access has been perhaps the largest single initiative of state and federal governments in higher education. In the 1960s, access was promoted primarily by the states through the establishment of community colleges in locations geographically accessible to state residents. In the past decade, the federal government took the initiative, dramatically expanding programs that provide need-based financial assistance directly to students. Many states also made large commitments to student financial aid programs. The federal government spends annually five billion dollars and states spend another one billion dollars in direct need-based financial assistance for students to promote their educational opportunities.

The attention given to promoting higher education opportunities is now waning. While questions of access will undoubtedly continue to attract attention, the area currently is secondary to concerns of quality, basic skills, student and faculty competence, budgetary practices, cost containment and accountability. Many resources will continue to be spent for access, but the continuous growth in these resources experienced over the past decade is not likely to continue. In fact, resources will probably decline in real dollars. In a sense, an era has come to a close.

Unfortunately, Little concerted attention has been given to (1) assessing what access means, (2) examining the values implied by the adoption of public policies to promote access, (3) measuring

the effectiveness of policies in achieving access, (4) determining the limitations of public policy vis a vis access and (5) assessing what strategies would be best, given the current situation, for preserving what has been gained or for promoting additional access.

Previous studies of access have been either conceptual in nature or limited in perspective. For example, the National Commission on the Financing of Postsecondary Education stated as well in 1973 as it has been stated since the objective of student access:

> Each individual should be able to enroll in some form of postsecondary education appropriate to that person's needs, capabilities, and motivation (p. 55).

However, this statement does not provide guidance to policy makers who must decide how to allocate funds to achieve this goal. The criteria proposed by the Commission for measuring achievement of the objective offer more specific guidance, including the "extent to which the student population and the college-age population are similar with respect to" (Ibid. p. 60) income, race, sex and family residence. However, with students of all ages attending college, what does the "college-age population" consist of? How is "similar" defined operationally? Are there objective standards that can be used or does it rest upon a consensus of opinion?

In early attempts to promote access, several states attempted to insure that an institution of higher education was located within commuting distance of all of the population or, realizing practical limitations, within commuting distance of a specified percentage of the population. These intentions were frequently

embodied in state master plans of the 1950s and 1960s, and achievement of access was evaluated in terms of geographical proximity to colleges (Willingham, 1970).

More recent efforts have focused on enrollment rates among different groups of individuals and the net price to the student as measures for evaluating achievement of access (Leslie, 1977, and Puma, 1980). However, these studies present results on measurements of access; their purposes do not include a consideration of the role of public policy in promoting access or of the cost of the accomplishments brought about by the public policies.

The purpose of this report is to address a number of fundamental questions about access. To state perhaps too simply, the report addresses four questions: (1) What is access, (2) how much access do we have, (3) how much access can we have and (4) how much access should we have. While it should be immediately pointed out that the report does not pretend to provide definitive answers to these questions, [redacted] offers a comprehensive context for examining these questions and provides information about many access issues related to these four questions.

The first chapter discusses different meanings of access and explains how different implications regarding public policy stem from various definitions of access. The word access is a "buzz" word in higher education. It has been used too freely in various contexts so that it no longer has a consistent meaning. From the outset it was defined in general, elusive, conceptual terms.

Consequently, several standards have been developed to measure access, and achievement of access still remains evasive because definite criteria have not been established. Adherence to different values regarding the proper role of public policy implies different access standards.

Chapter II presents a summary of the degree of access achieved by community colleges. While there are numerous ways of measuring access, attention is given primarily to two measures popularly used by policy makers for judging access and assessing the need for committing more resources or fewer resources to enhance access. One measure is based on enrollments of groups of individuals, and the other is based on the costs students pay to attend. A third additional measure that addresses more fundamentally the presumed purpose of access goals is the degree to which educational aspirations and expectations are met. This measure is also examined.

The limits of access are discussed in Chapter III. Present limited resources and competing interests translate this issue into considerations of how much can be achieved with the resources available; what is the best approach; and what can be done to provide access to those who do not have it. Three factors must be considered: (1) how access is defined, (2) the cost as well as the effectiveness of programs and (3) the limitations of various policy and nonpolicy factors in affecting access. Chapter III discusses the second and third factors.

While Chapter III defines the practical limits of fostering access through conventional government policy, Chapter IV examines practices of community colleges that affect access and suggests that the focal point of greatest activity affecting access may be

shifting from the government to the institution.

Chapter V discusses changing priorities and the likely importance of access in the 1980s. The first part of Chapter V identifies why the conventional argument for subsidizing education must be modified to fit the case for access today. The second part of the chapter deals with the changing emphasis of policy makers. Evidence of the commitment to access, or any other public policy goal, is seldom direct or explicit but can be gained by viewing the priorities and activities of policy makers.

A list of findings and observations are summarized in Chapter VI. Chapter VII presents the main conclusions and policy implications.

The choice of this framework for the report rests upon over two years of research undertaken with a contract from the National Institute of Education. The intent was to examine issues in community college finance and the impact that the financial issues are likely to have upon community college students and prospective students.

The effort began with a review of community college research literature that assessed current knowledge of (1) the characteristics of community college students, (2) enrollment behavior and educational needs assessment, (3) student financial aid and (4) conventional financing of community colleges. The majority of subsequent activities was at state, institutional and individual levels, although some national level data were examined. At the state level comparisons were made of enrollments, college participation and various student costs

between community colleges and state colleges among all states. Through surveys, additional information was collected on tuition and student financial aid policies among states.

At the institutional level, case studies of several institutions were conducted in California, Colorado, Florida, New York and Texas. The general purpose was to evaluate the particular financial problems facing the community college. The results differed widely in the five states, largely because of the circumstances of the state or region. In California, attention was limited to an assessment of institutional elements of access (practices, programs and policies fostering access). Attention was given in Texas to interinstitutional enrollment rates and student costs and to the extent of access attributable to the geographical location of institutions and to other institutional factors.

The individual level of analysis focused primarily on (1) identifying factors influencing enrollment behavior in a broad context that included both policy and nonpolicy factors and (2) determining the attributes of community college students in comparison with the attributes of students attending four-year institutions.

Several publications were prepared from various activities of the project. A list of the publications is given in the back of this report. The issue of access is central to many aspects of these reports because it has been an important priority of government in higher education over several decades. Because of the threat access now faces, it is appropriate to make a concerted

effort to scrutinize the issue.

Although a discussion of access extends to all levels of higher education, primary attention is given here to community colleges because they have been the most prominent vehicle for promoting access. Definitive answers to the four issues posed above are not part of this report; the value of this report lies in (1) raising these quite different aspects of access in the same context, (2) examining the reasoning and implications found among them, and (3) proposing directions for public policy to take depending upon the nature of access desired and the emphasis to be placed on it.

A broad group of institution administrators and policy makers, state and federal officials and students of higher education will find this report useful. It identifies the reasons for the ambiguity and rhetoric surrounding the issue of access; it assesses the degree of access that has been achieved; it discusses how the context of access has changed and what institutions and government officials may do to promote access in a period of fiscal stringency.

I. THE MEANING OF ACCESS

Because access has many contexts in higher education, the purpose of this chapter is to try to resolve some of the ambiguity surrounding the issue. First, as was pointed out in the introduction, there is no difficulty in defining access in the abstract. As the National Commission on the Financing of Postsecondary Education has stated, access means that educational opportunities should be provided to all who are able to benefit from the experience. This statement, however, does not allow one to know when the obligation has been provided and how to judge whether an individual is able. In operational terms access should be defined in ways in which it can be measured. The task is not easy. Standards used may be misleading, resulting in a disparity between actual outcome and intended policy objective.

A comprehensive discussion of access must include an analysis of many factors including institutional, enrollment and student characteristics. "These factors are inextricably linked, and any separation must seem artificial and contrived" (Olivas, 1979, p. 10). Furthermore, matriculation at an institution of higher education is only one step in the access hierarchy. Retention, graduation and subsequent utility of the acquired education are also elements of access.

Unfortunately, a thorough discussion of the full range of the implications of access goes beyond the purpose of this report. This report is limited to matriculation or enrollment access. Inclusion of more distant dimensions of access, such as retention, quickly leads into issues of employment opportunities and other

topics of such large import that they deserve separate treatment. What must be avoided is letting the complex issue of access be oversimplified by the usage of simple, common measures for the achievement of access.

While an explicit definition of access is difficult to obtain, three attributes can be identified that should be incorporated into an ideal definition of equal access. One is that barriers to attendance -- geographical, financial or informational -- be equalized among students and prospective students. Another is that there should be an institutionally supportive climate for students, which involves having appropriate student support services, academic program offerings and faculty and staff who are sensitive to the education and education-related needs of prospective students. Finally, recognition should be made of the differences among institutional sectors.

A comprehensive coverage of access includes a broad spectrum of issues. This report deliberately places an emphasis on community colleges. Community colleges are the entry point to higher education for most minorities, educationally disadvantaged students and adult students. Furthermore, community colleges have been in the forefront in advocating access.

This chapter begins with a discussion of the purpose of public policy and the usefulness of using the coincidence between educational aspirations and expectations and educational attainment as a measure of access. Following is a discussion of various problems of measurement that obscure assessments of the degree to which access is achieved when access is defined in terms

of enrollments or student costs.

The Purpose of Public Policy

The purpose of public policy is to change individual behavior by creating incentives or disincentives to behave differently than one would without the policy. In higher education much attention has been given to policies that raise the expectations of prospective students so that those who aspire to attend college, but who otherwise would not expect to attend, do attend. Policy is designed to affect the individual decision-making process by making attendance options more realistic and probable than they otherwise would be. Policy intervention may take any of several forms. It could be through the establishment of a new college close to the residence of the individuals for whom the policy is designed or through curricular offerings of interest to the prospective students. Over the last decade, policy intervention has largely been in the form of reducing financial barriers to attendance through the availability of student financial aid. In all of these instances, policy is meant to alter the expectations of the individual.

For the wealthy, prospective student, provision of student financial aid is not likely to alter his or her expectations for postsecondary education. Therefore, if the policy does not alter expectations, and subsequent actions, it is generally considered ineffective. Thus, one attribute of good public policy is that it is designed to alter expectations and outcomes in some prescribed way. A second quality of good policy is that it results in a

better alignment of an individual's aspirations and expectations. In the "conventional" case of providing student financial aid, the purpose of the policy is to lower financial barriers to attendance so that those who want to attend, but who otherwise cannot afford to attend, may attend. That is, expectations are raised through public policies so that they are consistent with the person's aspirations.

An equally good alignment can be found among those individuals who do not aspire to attend, do not expect to attend and who, in fact, do not attend. At this point, however, there is disagreement over the desirability of this condition. One argument is that individuals should be free to attend or not attend college as they wish. Public policy assistance should be reserved for those who want to attend; public policies should be designed to help those who are willing to help themselves. Those who are not interested should be free to pursue other interests.

The other argument is that this line of reasoning would be acceptable if those who wanted to go to college were uniformly distributed in the population by race, sex and income. However, this is not the case. Individuals of high socioeconomic status aspire to attend more frequently than individuals of low socioeconomic status. The issue then arises as to what is the appropriate role of public policy to modify aspirations. Debatable is whether the domain of public policy be limited to modifying expectations or also to include modifying aspirations. Although obtaining a consensus on this point may be difficult, the distinction is fundamental. Public policies appropriate for

modifying expectations may be quite different from policies used to change aspirations. Unfortunately, public policies designed to address the issue of access are tied to indicators -- for example, participation rates -- that may not properly reflect the modifications to aspirations, expectations and attainment that should be the key to measuring the success of public policies. Student financial aid was designed to reduce financial barriers to attendance, essentially by raising an individual's expectations for higher education attendance. However, after billions of dollars have been spent on financial aid, which has gone a long way toward reducing financial barriers to attendance, there is now concern that that is not enough. Many educationally and socioeconomically disadvantaged persons, especially minorities, are not attending. A suggested remedy is to reduce information barriers to attendance. The reasoning is that if disadvantaged individuals have more information about the benefits and the costs and means of financing higher education, more disadvantaged individuals would aspire to attend.

While this reasoning may well be correct, it would have been helpful at the outset of the access movement 20 or 30 years ago and less frustrating now to have thought of policy objectives in these terms. A public policy debate over the issue of access, framed in this context, would have led to a better understanding and evaluation of the achievement of the goals of such policies.

This perspective of aspirations and expectations for evaluating the appropriate role of public policy can be developed further. The table below presents a matrix of the degree of

alignment among aspirations, expectations and attainment prior to intervention through public policy.

Table 1

HYPOTHETICAL DISPOSITION AND EDUCATIONAL SITUATION OF AN INDIVIDUAL

Individual Disposition	Higher Education Situations							
	1	2	3	4	5	6	7	8
Aspires to attend	yes	yes	no	yes	no	no	yes	no
Expects to attend	yes	no	yes	no	yes	no	yes	no
Does attend	yes	yes	yes	no	no	yes	no	no

Cases 1 and 8 represent the extreme situations already described. Case 1 represents the individual who wants to attend, expects to and does. Public policy should not be addressed toward this individual. Case 8 represents the person who has no interest in college and does not plan to go and, in fact, does not go. This is the individual for whom there is disagreement about whether raising his or her aspirations and expectations should be a legitimate concern of public policy. Case 4 is the "typical" target of public policy. The person wants to attend college and will attend if his or her expectations are raised through the effects of public policy.

The other cases represent situations less concerned with access than the importance of deciding how education and on what basis education should be allocated among individuals. Case 2 represents the individual who wants to attend and against all odds somehow manages to attend. Case 3 could be viewed as the

individual who attends college because of family or peer pressure although he or she has no personal interest in attending. Case 5 could be viewed as the situation of a rebelling youngster. He or she does not want to go and refuses to do so, although the parents have urged the youngster to attend. Case 6 represents the individual who attends college out of default. The individual does not have any particular interest in attending but perhaps as a last minute thought decides to enroll. Case 7 might typify the situation of an individual whose plans unexpectedly change. The individual may have decided to get married or became more interested in employment although he or she had initially wanted to attend and expected to attend. Each of these intermediary cases represents a situation in which there is a discontinuous alignment among aspirations, expectations and attainment. Each therefore deserves a discussion of the appropriate role of public policy to modify the incentives various individuals have to attend or not attend.

Despite the clarification of policy issues that might flow from a better understanding of human behavior and the actions taken to modify behavior, primary attention regarding access has been given to measures of access in terms of either opportunities (student costs) or outcomes (enrollment rates). These are visible, popular measures used by policy makers for evaluating the effectiveness of access policies.

Access in Terms of Opportunity

From the 1950s to the early 1970s, access in terms of

opportunity was promoted through the establishment of community colleges dispersed throughout all regions of a state to provide geographical proximity for prospective students. Many states set goals of providing access by having an institution of higher education within commuting distance of a certain percentage of the population. The approach rested on the assumption that by doing this the state had equalized opportunity and that the decision to enroll or not to enroll reflected differences in individual preferences. The implied policy was to raise expectations for those who aspired to attend. In the 1970s, access was promoted by reducing financial barriers to attendance, largely through student financial aid. If student costs were equalized, taking into consideration student and family ability to pay, access presumably would be achieved. This standard of student costs is examined in this report as a measure of access defined in terms of opportunity.

Access in Terms of Outcome

Preference for measuring access in terms of outcomes is based on the belief that ability and preference for education are distributed equally among ethnic and income groups. Any significant differences in participation rates in higher education of these groups indicate that opportunities are not equal and that access, for any number of reasons, is not provided uniformly among groups. This measure of "access in terms of outcome," using participation rates and representation ratios, is the second standard used in this report for evaluating access.

When evaluation of access is made in terms of outcomes, student costs (specifically student financial aid) as well as a host of other factors -- such as the proximity of institutions, the curricular offerings or range of scheduling options -- all have an effect on enrollments. However, while some attention is given to these latter measures, it is limited because they (1) represent either policies, such as the establishment of community colleges, which have run their natural course or (2) represent a host of institution and state specific characteristics that are difficult to quantify. Particular attention is given to two measures, student costs and enrollments, because of their popularity among policy makers. These are "pressure points" to which legislators respond.

The Ambiguity of Measurement

The lack of a single standard of access makes evaluation of the achievement of access ambiguous and, by any standard, there are several ambiguous points of definition and measurement. For example, in the discussion of the purpose of public policy, distinctions between aspirations and expectations are not as well defined as implied. Aspirations are influenced by perception of what is possible. Consequently, policies designed to modify expectations of some individuals could have a secondary effect on aspirations of others, who then become candidates for policy intervention to modify expectations.

The purpose of this section is to discuss measurement errors and problems of definition that contribute to the ambiguity of

interpreting two popular access measures. One is the net price measure, which is the student cost of attendance minus student financial aid plus parental contribution. The desired outcome is to have students responsible for an equitable share of the education cost. The focus here is on student costs, addressing issues that are objective in nature and that can lead to improved assessment and measurement of access. The other popular access measurement, student enrollments, also is briefly discussed in the final part of this chapter.

Student's Costs and Resources

The conventional student's budget, which is composed of tuition and fees, room and board for resident students and transportation costs for commuters, books, supplies and miscellaneous expenses, is generally determined by the institution and largely taken for granted in deliberations regarding student financial need. The standard approach for determining equitable access is to see if, after reducing the student budget by available public resources, the private share matches the expected share. Another way of viewing the issue is in terms of the net price to the student, which is the cost of attendance minus financial aid. A determination of an appropriate net price rests upon a determination of the student cost of attendance and the student's, or family's, ability to pay. The question of how much should a student or his or her family pay to attend college is an important but separate consideration not discussed in this report. It also is an ongoing issue. The College Board (1981), the American College Testing program (Goggin, 1974), state student

financial aid agencies and, more recently, Congress (U.S. Department of Education, 1981), continually develop and discuss schedules of expected financial contributions. These are designed primarily to treat equitably financially similar students in similar institutions and financially dissimilar students attending similar institutions. Secondarily, they are directed to treating equitably students attending dissimilar institutions. While debate will continue over how ability to pay should be measured and over how heavily that ability to pay should be drawn upon, there is no definitive answer. The outcome depends largely upon the subjective values collectively accepted or agreed upon.

The way in which budgets are calculated results in biased estimates of financial need for students under certain circumstances of attendance. Perhaps the largest source of bias among estimates of student costs and subsequent calculations of need is due to the use of direct, total monetary costs for calculating a student's costs. From a public policy perspective, however, the relevant costs are those additional costs incurred. Some of the costs included in the student budget are costs that the student would incur regardless of his or her enrollment status. For example, everyone must have food and shelter. While board and room on campus probably costs more than at home, a student living on campus saves the cost of board at home, but no adjustment is made to the student's budget to reflect this savings. A similar argument can be made regarding some miscellaneous personal expenses and certain transportation costs, such as automobile insurance for the commuter, which would be

incurred in most cases even if the individual did not attend college. Consequently, the actual increase in cost that a student, and his or her family, must consider in deciding to attend college may be one-half or two-thirds of the institutionally estimated student budget (Nelson, 1980), although calculation of student financial need characteristically is based on the total student budget.

Another cost, which particularly affects low-income people, is foregone earnings, which is the income that a student would earn if he or she were to work instead of attend college. It is an appropriate cost for the individual whose choice is between working and attending college. Since work options are more frequently experienced by low-income families, foregone earnings constitute a more serious barrier to attendance for these individuals. This situation may partially explain why so many low-income students attend community colleges. They are able to reduce foregone earnings by working while attending college at home and at the same time reduce board and room costs.

Another factor that is not included in these deliberations is the temporary alteration of standard of living that students often undergo to meet their financial situations. According to the College Board, the national average student expense budget for nine months at a community college is about $3,200 for a single student living on campus and about $400 less for a commuting student (College Board, 1981). For a married student or a student with children, the budgets are greater. Financial aid resources to meet a budget of this magnitude are grossly inadequate. A Pell

Grant would provide about $900; self-help is, perhaps, $750, leaving $1,350 of a $3,000 budget to be met by state aid funds or other federal programs. Much of the aid need is not met. Nevertheless, many recipients still attend college. This paradox could be explained in part if budget cost calculations are overestimated, as occurs when the total cost rather than the marginal cost of attendance is used.

The paradox might also be explained if students temporarily changed their living standards. Standard adjustments are made for room and board, personal expenses, transportation and child care, but most every college student has scrimped at one time or another. While hardly anyone is willing to make such changes permanently, nearly all are willing to make temporary adjustments. Some costs, such as clothing, health care and transportation can be postponed. The ability of an individual to make such adjustments is probably different for youths without other commitments and for adults with family and other responsibilities. Since student budget calculations do not recognize these distinctions, some students, especially adults, may not be able to reduce their financial needs as much as other students. For these reasons it is difficult to understand the practical significance of calculations showing unmet financial need and to interpret their impact on individuals' decisions to enroll or to continue attendance.

Students living at home while attending college also substantially alter the educational value of the college experience. College attendance provides cognitive and affective

benefits for the student. Although many students choose to commute to college rather than to reside on campus, the total college experience is quite different. Because of the large numbers of commuters at community colleges and the dominance of resident students at four-year colleges, the value of the community college experience is diminished for certain affective skills (Astin, 1977). For this reason, reducing a comparison -- of the value of these two types of experiences to that of direct student costs -- understates the real difference.

A further consideration that clouds the conceptually simple net price idea is that there are several kinds of student financial aid that are valued differently by the recipient. Recipients of aid generally receive an aid package that may include a grant, a loan and a work-study component. A loan must be repaid; work earnings must be earned. Consequently, the value to a student of a dollar loan or a work opportunity is less than the value of a dollar grant, although they all are counted at face value when calculating the amount of aid to award and when estimating a student's net price. Acceptance of this practice implicitly assumes that the relevant financial obstacle to attendance is the current, out-of-pocket cost to the student. In fact, some students are reluctant to incur any debt to finance their education or at least are concerned about how much they borrow (Carlson, 1975, and Hyde, 1980b).

Despite the popularity of work study programs, students recognize the commitment of time and effort that comes with work. If students' preferences for the distribution of leisure time and

employment over their life cycle and the discounted, present value of loans were taken into consideration when packaging aid and calculating net prices, financial aid as an instrument of public policy would be allocated differently. Some students would prefer to borrow more and others less. The problem for policy makers is that the approach just described is difficult to quantify and that students' actual value of aid, in terms of affecting their enrollment behavior, probably is a combination of the current out-of-pocket cost and present value cost. While determination of the value of aid packages is an empirically tractable exercise, the point to be made here is that aid dollars as administered are of varying value to a student. Therefore a specified net price dollar amount may have a variable effect on enrollment behavior. To the extent that community college students receive fewer and smaller loans than students at four-year colleges, the bias for community college students in the calculation of the net price is less than for students at other institutions because the face value of loans are used in calculating the reduction of student financial need.

A cost consideration that understates the cost to commuting students is transportation. The direct money costs of transportation is about $150 greater than the $400 to $450 transportation allowance in the institutionally determined student's budget. Furthermore, the imputed cost of time spent in commuting, estimated to be about $250, is totally ignored. Because 95 percent of community college students commute, while only about half of the students at four-year institutions commute,

the bias is greater for community college students (Hyde, 1980a).

A problem that obscures the measurement of the effect of net price on access is that access and choice are inextricably related. Financial aid may promote either access or choice. Through common usage, access is associated with allowing individuals to attend college, particularly community colleges. Choice is associated with allowing individuals to choose among colleges, often including high cost private colleges. As a generalization this is a reasonable assessment of the practical outcome, but conceptually the issue is quite different. Whether an aid award is classified as promoting access or choice depends entirely on the value system of the individual. The cost of attendance of the institution is of no concern. By illustration, assume that student A has the option of attending college X for $700 or college Y for $1,000. If, without aid, A would not attend but with aid would attend college X, then the aid has provided access. If individual B without aid would attend college X, but with the same amount of aid as A would attend college Y, the aid has provided choice. Consequently, aid programs offer simultaneous opportunities for access and choice.*

In essence the net price concept is a simple measure of equal access in terms of financial opportunity, but it obscures several ambiguities that are not easily resolved. Net price is a function of cost of attendance and financial aid, but costs for the purpose

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*Estimates have been made of the degree to which aid promotes new enrollments compared to shifts in enrollments. See, for example, McPherson (1978).

of computing a student budget are different from the costs that should be considered in the context of providing a public subsidy. The ambiguity of evaluating student financial aid is that different types of aid do not have the same value to the student although they all are viewed similarly in terms of reducing student costs. Finally, the net price concept obscures the inherently dissimilar value and opportunity associated with attendance at different types of institutions.

Student Enrollments

Access in terms of enrollments can be defined in at least two ways. The value of each is limited by its frame of reference. One approach is to count enrollments in relation to the population from which the enrollments are derived. The resultant participation rate is often calculated for populations of different ethnicity, income or sex. A second approach draws upon the first. It involves calculating a representation ratio relating one participation rate to another. A representation ratio can be defined as the ratio of (1) the participation rate of students in one type of institution to (2) the participation rate of students in another type of institution. In other terms, making a comparison between groups within an institution, if the issue is minority enrollment, the representation ratio is the ratio of (1) the portion of total enrollment that is minority to (2) the portion of the total population that is minority. The two measures provide different information about enrollments. A participation rate indicates the extent to which a population is involved in higher education. A representation ratio indicates

the relative representation of a population in higher education. For example, a state with a population of 200,000 Blacks and 20,000 Black students has a Black participation rate of 10 percent. While participation rates can be compared among states or among various groups, they do not provide information on the "drawing power" of an institution. In the above example, the attendance of 20,000 Blacks out of a population of 200,000 has a different significance depending upon the size of the total population and the number of total enrollments. If the total population is 1,000,000 and total enrollment is 150,000, then the representation ratio is .67. Thus the institutions are attracting other students in greater relative numbers than Blacks. If, however, the total population were 500,000 and total enrollment were 30,000, then the representation ratio would be 1.33. Here the institutions would be extraordinarily successful in enrolling Blacks. Because a participation rate and a representation ratio both give information not provided by the other, both are used in this report.

Another measurement issue arises over what is the appropriate definition of the relevant population for calculating participation rates. Historically, the rates were based on the 18- to 22-year-old population, regarded as the conventional college going age group. More recently, the influx of older students indicates that the range of ages from which students are drawn should be expanded. In Chapter II rates are based on the 15 to 35 age group. Although some students are certainly drawn from outside this population, no significant bias should occur in state

comparisons with the possible exception of those states, such as Florida and Arizona, that have a large proportion of older residents.

From this chapter three conclusions can be drawn. One is that there is no best definition or measure of access. Each has flaws and is based on implicit value laden judgments. A second conclusion is that the context of access changes. Practical implications of access change as public priorities evolve. It is also a conclusion of this chapter that access is ambiguous in both concept and measurement. When a person speaks of access, various assumptions are implied but often not stated, leading to confusing rhetoric. Popular measures of access are perhaps unavoidably ambiguous. Access has many dimensions, and its complexity cannot be captured by one measure without distortion.

II. AN ASSESSMENT OF ACCESS ACHIEVED

By most standards, Americans have more access now than in the past. Whether this level of access represents a sufficient level and whether it will be maintained are different questions. It is often convenient to know previous achievement before deciding future direction. The purpose of this chapter is to present information on the extent that community college access has been achieved in terms of fulfilled aspirations and expectations, enrollments and student costs.

Fulfillment of Educational Aspirations and Expectations

Widespread aspirations and expectations for college attendance are recent phenomena. Prior to 1960, the proportion of high school seniors expecting to attend college was small; most of those who expected to attend did attend. Beginning in the 1960s, the federal government introduced legislation to encourage postsecondary education attendance. Government policies for student financial aid, affirmative action and proliferation of community colleges, among other factors, raised the consciousness and aspirations of many individuals who previously would not have aspired to college attendance. Between 1959 and 1966 the proportion of high school seniors from the lowest income quartile hoping to attend college doubled (Froomkin, 1970). While information is not available on more recent aspirations for college attendance, presumably they have continued to rise; expectations definitely have. Table 2 compares the educational

Table 2

EDUCATIONAL EXPECTATIONS OF 1972 AND 1980 HIGH SCHOOL SENIORS, BY SEX, RACIAL AND ETHNIC GROUP, AND SOCIOECONOMIC STATUS (SES)

Item	Educational Expectations			
	Total	No College	Some College	Four or More Years of College
	Percentage Distribution of 1972 Seniors			
All 1972 seniors	100.0	44.7	12.4	42.9
Sex:				
Male	100.0	36.9	11.4	51.6
Female	100.0	45.3	13.2	41.5
Racial/ethnic group:				
White[1]	100.0	40.4	12.4	47.2
Black[1]	100.0	44.0	9.8	46.2
Hispanic	100.0	45.3	20.6	34.1
SES:[2]				
Low	100.0	63.5	10.2	26.3
Middle	100.0	45.0	14.6	40.4
High	100.0	15.9	9.9	74.2
	Percentage Distribution of 1980 Seniors			
All 1980 seniors	100.0	39.0	15.0	46.0
Sex:				
Male	100.0	41.1	11.7	47.2
Female	100.0	37.1	18.1	44.9
Racial/ethnic group:				
White[1]	100.0	39.3	15.1	45.6
Black[1]	100.0	38.5	14.0	47.5
Hispanic	100.0	46.3	17.8	36.0

Table 2 (continued)

EDUCATIONAL EXPECTATIONS OF 1972 AND 1980 HIGH SCHOOL SENIORS, BY SEX, RACIAL AND ETHNIC GROUP, AND SOCIOECONOMIC STATUS (SES)

Item	Total	Educational Expectations		
		No College	Some College	Four or More Years of College
	Percentage Distribution of 1980 Seniors			
SES:[2]				
Low	100.0	58.8	15.1	26.2
Middle	100.0	40.7	17.4	41.9
High	100.0	13.6	10.7	75.8

NOTE: Details may not add to totals because of rounding.

[1]Non-Hispanic.

[2]The SES index was based upon a composite score involving father's education, mother's education, parental income, father's occupation and a household items index.

SOURCE: Nancy B. Dearman and Valena White Plisko, National Center for Education Statistics, The Condition of Education, 1981 Edition (Washington, D.C.), p. 126.

expectations of high school seniors in 1972 and 1980. Information is drawn from the National Longitudinal Study of the High School Class of 1972 and from the High School and Beyond Survey. Although results of the surveys were not compiled to allow specific identification of community colleges, interest in "some college" serves as a weak proxy for community colleges. For all categories of sex, race, and socioeconomic status (except for males and Hispanics), educational expectations have increased for college attendance in general and community college attendance in particular. In 1972, 12.4 percent of the high school graduates expected to obtain some college education; in 1980, 15.0 percent expected to obtain some college. Those expecting four or more years of college increased from 42.9 percent to 46.0 percent during this eight year period.

The reduction in male expectations may reflect changing personal values and a diminution in the economic rate of return to college, especially for white males. The reason for the lessened interest of Hispanics in higher education is not clear. It may be due to measurement error. Hispanics are the smallest minority group for which separate statistics are reported.

A comparison of educational attainment in 1979 with educational expectations in 1972 (see Table 3) shows that the success of realizing expectations is mixed. On the one hand, some individuals did not obtain by 1979 the education they expected when they graduated from high school in 1972. On the other hand, some high school seniors by 1979 had obtained more education than they had expected in 1972.

Table 3

EDUCATIONAL EXPECTATIONS OF HIGH SCHOOL SENIORS IN SPRING 1972 AND THEIR ATTAINMENT IN FALL 1979, BY SEX, RACIAL AND ETHNIC GROUP, AND LOW SOCIOECONOMIC STATUS (SES)

Educational Expectation, Spring 1972	Educational Attainment, Fall 1979			
Item	Total	No College	Some College	Four or More Years of College
All persons	100.0	35.2	37.7	24.0
No college	100.0	68.3	29.4	2.4
Some college	100.0	20.3	68.5	11.3
4- or 5-years	100.0	5.4	40.8	53.8
Graduate school	100.0	4.0	29.7	66.2
Blacks:[1]	100.0	37.2	42.3	20.5
No college	100.0	64.2	31.7	4.1
Some college	100.0	25.4	64.5	9.1
4- or 5-years	100.0	10.8	52.3	36.9
Graduate school	100.0	7.1	41.2	51.6
Hispanics:	100.0	40.5	46.2	13.3
No college	100.0	65.1	32.9	2.0
Some college	100.0	19.6	73.5	6.9
4- or 5-years	100.0	10.1	56.8	33.1
Graduate school	100.0	12.2	41.6	46.2
Low SES	100.0	55.0	33.4	11.6
No college	100.0	75.1	23.3	1.7
Some college	100.0	29.5	63.4	7.1
4-or 5-years	100.0	10.7	49.6	39.7
Graduate school	100.0	12.6	43.4	44.0
High SES	100.0	11.2	37.3	51.5
No college	100.0	49.2	46.2	4.6
Some college	100.0	12.7	73.2	14.1
4- or 5-years	100.0	1.9	33.5	64.6
Graduate school	100.0	.7	22.5	76.8

NOTE: Details may not add to totals because of rounding.

[1]Non-Hispanic.

SOURCE: Nancy B. Dearman and Valena White Plisko, National Center for Education Statistics, The Condition of Education, 1981 Edition (Washington, D.C.), p. 128.

For those seniors in 1972 expecting to attain some college but less than four years (12.4 percent, in Table 2), 20.3 percent (Table 3) had not attended college at all by the fall of 1979. More than twice that percentage of seniors who had educational expectations for four or more years of college had not attained their goals. Those who sought four or more years of college generally attained at least some college. Only five percent of those expecting in 1972 four or more years of college had attained none by 1979. However, Blacks and Hispanics had twice as large a proportion as the seniors in general who expected to attain four or more years of education but had not attained any. This disparity may be due to the self-perception minorities have (Berne, 1977), or their expectations may be falsely raised by misleading information they receive. Minorities who perform well in dominantly minority schools with lower than average standards may not be adequately prepared for college and graduate school although their relative high school performance might suggest that they are (Preer, 1981).

The situation for those of low socioeconomic status (SES) is worse. While roughly the same percentage of low SES individuals as Blacks and Hispanics expecting to attain four or more years of college do not attend at all, the percentage of those expecting some college but obtaining none is 29.5. (It is 26.4 percent for Blacks and 19.6 percent for Hispanics.) While more attention perhaps should be given to assisting the low income group, the divergence in the degree of expectations attained between minorities and low-income individuals can be viewed as a positive

sign of progress toward socioeconomic and educational integration of minorities.

The degree to which the difference between 1972 expectations and 1979 attainment represents unfulfilled expectations is not completely known because some individuals may have reduced their expectations after high school graduation. The other side of this issue is that other individuals may have increased their expectations; data indicate that a substantial number of the 1972 seniors have. These greater expectations may be due to a host of institutional, state and federal policies regarding discrimination in admissions and employment in both the economy and higher education institutions, curricular content and course scheduling. They also may be attributable to a greater acceptance of the practice of mixing periods of work with periods of formal schooling as well as increased student financial aid. The net effect is that, in 1972, 55.3 percent of the high school seniors (from Table 2, the sum of 12.4 and 42.9) expected to attend college, but by 1979 61.7 percent (from Table 3, the sum of 37.7 and 24.0) had attended college. Of those in 1972 expecting to obtain "some college," but less than a bachelor's degree, 68.5 percent did; an additional 11.3 percent obtained further education.

The same phenomenon occurs fairly uniformly among Blacks, Hispanics and low SES individuals. The percentage of Blacks and Hispanics attaining any amount of college is five to six percentage points above the percentage of 1972 high school seniors expecting to attend college. For the low-SES group, the increase

is larger (8.5 percentage points).

Personal values may change also and result in greater enrollment than initially expected. A comparison of the low and high SES groups shows that, whatever these factors are, they have a greater influence on high SES individuals than low SES individuals. Three out of four low SES seniors not expecting to attend did not attend. Among high SES individuals only half of those expecting not to attend did not. At the other extreme, among those with high education expectations, about two-thirds of the high SES individuals who expected to obtain four or more years of college did while about two-fifths of the low SES individuals with similar expectations obtained four or more years of college.

Increases in expectations about college attendance that occur after high school graduation may result dominantly in community college enrollment. Of the one-third of Blacks and Hispanics and one-fourth of low SES individuals who attend college by 1979 despite their expectation in 1972 of not attending at all, nearly all of the attainment constitutes "some college," the category for community college attendance. Although it is not known what percentage may be in progress toward a degree in, or may have dropped out of, some other type of postsecondary institution, most of them are probably attending community colleges.

The extent to which the educational expectations of current students are met awaits future developments. If the relationship found between 1972 expectations and 1979 attainments is maintained, the degree of access achieved will remain the same given the criterion of fulfillment of expectations. However, more

individuals probably will enroll in higher education because of the heightened expectations. If the gap between attainment and expectations is reduced, additional enrollments and greater achievement of access will occur.

Enrollments

The role of community colleges in increasing enrollments in higher education can be measured in several ways. One is by the market share they hold, which has been rising rapidly. In 1960, 14 percent of undergraduate enrollments in higher education were in public two-year colleges. By 1976, 34 percent of the students were in public two-year colleges (mostly community colleges) and, by 2000, over 40 percent will probably attend these colleges (Carnegie Council, 1980). The degree to which particular minority populations have increased their participation in community colleges is more difficult to assess because historical data on minority enrollments are not easily found and are not always in agreement.

Nevertheless, "it appears that the percentage increase in the number of minority students has been greater than for enrollments as a whole during the 1970s" (Gilbert, 1979, p. 11). Blacks have constituted slightly over 12 percent of the population for the last decade, but Black enrollments as a percentage of total enrollments have increased from 8.4 percent in 1971 to 10.0 percent in 1979. Hispanics have not been as successful. Data are not available for 1971, but from 1975 to 1979, Hispanics grew from 5.5 to 6.3 percent of the population. Their enrollments, however,

declined from 4.3 to 4.2 percent of college enrollments (Dearman and Plisko, 1981).

As of 1978, public two-year institutions enrolled 34.5 percent of all postsecondary education students but 40.4 percent of minority students (see Table 4). Blacks, the minority group that has been the target of public policies longer than other groups, have become more integrated into higher education than other minorities. A smaller percentage of Black students (39.3 percent) than other minority students (49.3 percent), and specially Hispanic students (53.3 percent), attend community colleges. For most minorities, community colleges serve as the main point for assimilation into higher education. Over time other minority students besides Blacks may become more dispersed as well.

Two other measures -- participation rates and representation ratios -- can be used to assess the degree to which community colleges serve minorities. Both have been calculated for the states and are presented in Tables 5 and 6. Table 5 gives the participation rates for Anglo and Black males and females for each state.* The figures are provided to give a sense of the variation among states rather than to document the actual participation rate of any particular state. In fact, the information in the table should not be used except for general approximations. The data are from the Higher Education General Information Survey (HEGIS)

*Additional categories of race or ethnicity are not given because of the small population sizes. The category Anglo does not include native Spanish speaking persons.

Table 4

ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION, BY RACIAL AND ETHNIC GROUP AND CONTROL AND TYPE OF INSTITUTION: FALL 1978

Type and Control of Institution	Total[1]	White[2]	Black[2]	Hispanic	Asian or Pacific Islander	American Indian/ Alaskan Native
All institutions:						
Number	11,231,172	9,194,031	1,054,371	417,271	235,064	77,873
Percent	100.0	100.0	100.0	100.0	100.0	100.0
Public universities:						
Number	2,062,293	1,807,325	102,162	36,027	42,633	9,738
Percent	18.4	19.7	9.7	8.6	18.1	12.5
Private Universities:						
Number	718,434	600,237	44,825	17,091	17,871	2,266
Percent	6.4	6.5	4.3	4.1	7.6	2.9
Public other 4-year:						
Number	2,833,759	2,277,778	322,718	104,221	56,468	17,447
Percent	25.2	24.8	30.6	25.0	24.0	22.4
Private other 4-year:						
Number	1,588,220	1,341,883	142,050	33,014	20,869	5,541
Percent	14.1	14.6	13.5	7.9	8.9	7.1
Public 2-year:						
Number	3,873,690	3,050,957	414,640	222,284	96,300	41,263
Percent	34.5	33.2	39.3	53.3	41.0	53.0
Private 2-year:						
Number	154,776	115,833	27,976	4,634	923	1,618
Percent	1.4	1.3	2.7	1.1	.4	2.1

[1]Represents the total head count for all races of students in the 50 states and D.C., a difference of 31,184 from the total head count of all students because some institutions were unable to identify the race of students enrolled.

[2]Non-Hispanic.

NOTE: Details may not add to totals because of rounding.

SOURCE: Nancy B. Dearman and Valena White Plisko, National Center for Education Statistics, The Condition of Education, 1980 Edition (Washington, D.C.), p. 110.

Table 5

STATE PARTICIPATION RATES FOR COMMUNITY COLLEGES AND STATE COLLEGES, BY RACE AND SEX, 1978-79[a]

	Community Colleges				State Colleges			
	Anglo		Black		Anglo		Black	
	Male	Female	Male	Female	Male	Female	Male	Female
Alabama	42.7	38.6	28.4	37.7	67.1	57.6	50.0	63.5
Alaska	131.2	220.7	121.8	217.8	29.8	55.3	27.1	49.2
Arizona	163.9	147.2	229.1	163.7	25.1	22.3	9.9	5.1
Arkansas	20.7	20.7	13.4	18.8	36.4	42.2	25.0	31.5
California	151.9	144.4	213.9	226.3	47.1	43.5	46.7	57.3
Colorado	51.9	53.1	69.6	60.2	58.6	52.8	66.6	75.9
Connecticut	43.0	46.7	53.5	63.2	33.2	43.0	10.1	11.6
Delaware	35.3	30.2	36.0	51.1	7.7	5.0	57.2	52.2
Florida	101.3	104.7	55.7	89.6	39.0	34.0	10.3	13.9
Georgia	27.4	26.0	15.7	19.3	58.8	50.2	30.8	45.9
Hawaii	83.4	43.5	42.2	97.6	11.7	8.0	6.3	8.5
Idaho	21.9	22.5	25.5	0.0	84.0	81.6	115.4	204.2
Illinois	84.0	87.7	81.3	96.0	23.6	23.4	23.5	35.1
Indiana	14.7	8.9	20.4	14.1	5.7	6.2	2.7	4.0
Iowa	36.3	37.6	72.4	34.4	12.2	15.3	20.9	26.0
Kansas	42.2	49.3	103.0	39.4	36.3	36.0	34.3	24.0
Kentucky	13.0	18.5	18.1	33.7	47.6	58.4	55.1	58.0
Louisiana	16.3	11.6	14.8	13.8	60.6	61.1	56.8	77.6
Maine	21.8	18.8	13.9	8.6	----b	----b	----b	-----b
Maryland	69.4	75.5	62.5	88.1	31.3	28.9	49.9	68.6
Massachusetts	36.3	41.9	25.1	28.0	42.0	44.4	34.8	34.1
Michigan	70.3	65.3	65.5	83.9	45.0	43.2	15.9	17.1
Minnesota	26.0	32.4	34.2	23.2	36.9	38.7	30.2	18.4
Mississippi	58.6	60.0	35.7	40.6	33.4	42.3	56.3	73.9
Missouri	34.2	34.3	52.0	72.9	40.2	42.5	22.4	23.5
Montana	9.9	14.6	9.1	4.2	32.9	35.7	69.7	87.5
Nebraska	41.8	35.4	53.1	30.6	58.1	62.4	69.6	77.9
Nevada	123.3	102.9	132.5	105.8	59.7	53.9	44.6	43.2
New Hampshire	24.6	19.9	36.6	18.1	24.7	36.7	5.9	0.0
New Jersey	42.5	46.4	44.3	57.5	45.6	47.0	26.1	36.6
New Mexico	20.2	20.7	22.1	21.9	22.2	18.3	61.3	34.9
New York	45.9	42.0	34.2	46.0	39.6	40.4	43.8	62.0
North Carolina	63.0	56.9	55.6	58.2	----b	----b	-----b	-----b
North Dakota	46.0	31.7	16.8	16.1	22.5	37.0	62.5	48.2
Ohio	33.6	36.8	36.2	53.7	17.0	13.3	19.7	21.8
Oklahoma	52.4	54.4	65.4	70.0	48.7	52.0	76.3	69.4
Oregon	106.1	109.4	96.4	71.6	42.5	42.1	59.1	45.2
Pennsylvania	22.1	22.6	29.9	42.4	21.5	26.2	23.2	20.8
Rhode Island	30.0	45.1	21.1	36.1	18.9	43.6	24.5	43.6
South Carolina	58.0	36.7	49.9	40.6	16.4	27.4	15.8	25.2

Table 5 (continued)

STATE PARTICIPATION RATES FOR COMMUNITY COLLEGES AND STATE COLLEGES, BY RACE AND SEX, 1978-79[a]

	Community Colleges				State Colleges			
	Anglo		Black		Anglo		Black	
	Male	Female	Male	Female	Male	Female	Male	Female
South Dakota	-----b	-----b	-----b	-----b	43.9	38.1	39.7	19.2
Tennessee	28.6	29.3	34.7	40.3	48.4	45.9	54.1	64.7
Texas	68.8	56.0	64.4	62.4	43.9	36.8	44.7	47.2
Utah	52.4	27.3	17.1	23.3	34.4	24.1	50.8	101.4
Vermont	15.5	20.3	0.0	0.0	30.3	36.6	69.2	69.3
Virginia	67.8	76.3	47.3	60.9	36.8	48.9	44.9	58.8
Washington	136.5	166.9	153.7	155.6	23.2	26.8	12.6	17.5
West Virginia	19.2	21.3	16.8	12.9	65.1	68.0	151.2	119.1
Wisconsin	58.0	50.7	75.8	79.2	79.2	76.5	61.9	69.0
Wyoming	93.2	127.7	156.6	133.7	----b	----b	-----b	-----b
Average for the States (unweighted)	54.2	54.9	56.6	58.4	37.9	39.9	42.3	48.1

[a]Participation rates per 1,000 population aged 15 to 35.

[b]Data are not available or the state does not have state or community colleges.

SOURCE: Compiled from 1978-79 HEGIS reports and 1970 Census data.

reports and include the various problems associated with that survey (see, for example, Hyatt and Thompson, 1980). In Tables 5 and 6 community colleges are defined as public two-year institutions. Consequently, vocational institutes, as in Indiana and Wisconsin, are included as community colleges, although by a strict definition they would be excluded. For comparative purposes participation rates are calculated for both community and state colleges. The rates are expressed in terms of the number of students per 1,000 population aged 15 to 35.

The rates vary substantially among states as well as between community colleges and state colleges. In general the data reflect much of what is known about the systems of higher education. For example, California has a large community college system, and the data in Table 5 suggest a large system. The participation rate for Black women in California community colleges is the highest among the states; it is second to Arizona for Black males. Among Anglos, California community colleges also have high participation rates, but they are less than the rates in Alaska, Arizona and Washington for either males or females. Florida's large retired Anglo population and the existence of universities without lower division programs undoubtedly contributes to the community college enrollment and the high participation rate. States such as Louisiana, Maine, Montana, New Mexico and West Virginia have community college participation rates that are only a fifth or less of the rates of the states with dominant community college systems.

The significance of the community college participation rates

is enhanced by comparing them with the participation rates for state colleges. The relative prominence of the community college systems in Alaska, Arizona, California, Florida, Nevada, Oregon, and Washington is made clear in that the participation rate for state colleges is generally half or less the rate for community colleges regardless of ethnicity.

The representation ratios (defined as the percentage of enrollment that is minority divided by the percentage of population that is minority) for community colleges for each state for Black and Anglo males and females are given in Table 6. Several results are noteworthy. First, when viewing the states, it appears that Anglo and Black males enroll in community colleges very nearly in proportion to their numbers in the population of the states, while Black females are slightly underrepresented. The degree of representation is modified when the state ratios are weighted by the populations of the states. The ratios are smaller when weighted, except for Black females, indicating that community colleges in states with small populations serve their populations more extensively than community colleges in states with large populations.

The largest difference between weighted and unweighted averages is for Black males. The higher unweighted value implies that community colleges in states with small populations serve Black males more extensively than do community colleges in larger states. A possible explanation is that Blacks in large states have more alternative types of postsecondary educational institutions to choose from, including all Black colleges. To the

Table 6

STATE REPRESENTATION RATIOS FOR COMMUNITY COLLEGES, BY RACE AND SEX, 1978-79

	Number of Colleges[a]	Anglo		Black	
		Male	Female	Male	Female
Alabama	20	1.089	.984	.728	.954
Alaska	9	.827	1.390	.750	1.333
Arizona	13	1.161	1.062	1.333	.866
Arkansas	9	1.014	1.016	.650	.910
California	104	1.040	.980	1.228	1.270
Colorado	14	1.002	1.034	1.166	1.000
Connecticut	16	.936	1.019	1.129	1.315
Delaware	4	1.026	.880	1.044	1.466
Florida	28	1.005	1.050	.506	.820
Georgia	16	1.109	1.051	.623	.776
Hawaii	6	1.004	.530	.500	1.000
Idaho	2	.995	1.027	1.000	.000
Illinois	49	.977	1.016	.903	1.067
Indiana	10	1.198	.728	1.636	1.138
Iowa	19	.960	.991	2.000	.857
Kansas	20	.913	1.066	2.250	.826
Kentucky	1	.777	1.110	1.085	2.029
Louisiana	6	1.138	.812	1.007	.934
Maine	3	1.081	.929	.666	.500
Maryland	19	.934	1.014	.835	1.166
Massachusetts	17	.930	1.076	.625	.684
Michigan	29	1.009	.936	.925	1.180
Minnesota	20	.886	1.104	1.200	.800
Mississippi	18	1.128	1.155	.677	.773
Missouri	15	.910	.912	1.375	1.910
Montana	3	.742	1.095	.666	.400
Nebraska	10	1.077	.914	1.333	.800
Nevada	3	1.125	.943	1.137	.903
New Hampshire	7	1.122	.908	1.562	.952
New Jersey	16	.918	1.004	.927	1.194
New Mexico	8	1.338	1.767	.900	.888
New York	42	1.054	.968	.728	.986
North Carolina	57	1.063	.957	.932	.963
North Dakota	5	1.131	.779	.555	.411
Ohio	47	.921	1.008	1.000	1.460
Oklahoma	15	.920	.952	1.129	1.205
Oregon	13	.967	1.000	.895	.222
Pennsylvania	17	.920	.941	1.243	1.740
Rhode Island	1	.818	1.231	.588	1.000
South Carolina	21	1.232	.777	1.049	.850
South Dakota[b]	--	-----	-----	-----	-----

Table 6 (continued)

STATE REPRESENTATION RATIOS FOR COMMUNITY COLLEGES, BY RACE AND SEX, 1978-79

	Number of Colleges[a]	Anglo		Black	
		Male	Female	Male	Female
Tennessee	11	.940	.964	1.142	1.320
Texas	57	1.145	.949	.844	.825
Utah	5	1.337	.696	.491	.476
Vermont	2	.871	1.142	.000	.000
Virginia	24	.975	1.093	.678	.863
Washington	26	.875	1.067	1.000	.918
West Virginia	5	.952	1.052	.866	.666
Wisconsin	17	1.049	.919	1.400	1.388
Wyoming	7	.870	1.207	1.296	1.142
Average for the States (unweighted)		1.008	1.004	.984	.962
Average Weighted by Enrollment and Population		.987	.963	.849	.966

[a]The number of colleges reported is based on the number of colleges with usable data.

[b]South Dakota has no community colleges.

SOURCE: Compiled from 1978-79 HEGIS reports and 1970 Census data.

extent that they exercise other college options instead of the community college option, the ratios will be lower.

Another observation is that many states have greater than proportional representation (a ratio greater than one) of Blacks in community colleges. For Black males, 21 states have ratios greater than one, and 17 states have ratios for Black females greater than one. Among Anglos, the number of states with more than proportional representation is slightly higher, about half of all states for men and women. Using this criterion of the representation ratios for Blacks, state community college systems do not draw extraordinarily heavily upon Blacks.* However, this criterion used alone is misleading because Blacks participate in higher education to a lesser degree than Anglos.

In an effort to address the issue of whether community colleges enroll Blacks any more frequently relative to (1) their numbers in the population and (2) their participation in other colleges, representation ratios for community colleges and state

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*The representation ratios for Anglos, relative to those for Blacks, tend to be understated because of an artifact in the calculation of the representation ratios. An example will illustrate the bias. If the minority population is 20 percent, then a representation ratio of 1.500 can be achieved by having a student population that is 30 percent minority. For a population that is 80 percent Anglo, however, it is impossible to have a representation ratio of 1.500. If the entire student population were Anglo that would yield a ratio of only 1.250. Largely because of this bias the range of variation in the representation ratios among states is narrower for Anglos than Blacks. The range of ratios for Anglos, except for seven states, is from 0.800 to 1.200, or within 20 percent of proportional representation. For Blacks, the variation in ratios is greater; only half the states have representation ratios within this range. This bias tends to overstate Black representation relative to Anglo representation.

colleges are calculated for Blacks in each state.* To facilitate making comparisons between the two types of institutions, the community college representation ratio is divided by the representation ratio for state colleges. The results are given in Table 7. The data show the representation of Blacks in community colleges relative to their representation in state colleges. The first figure, the ratio of 0.932 for Alabama Black males, was derived by dividing the representation ratio of Alabama Black males in community colleges (0.728) by the representation ratio of Alabama Black males in state colleges (0.781). Thus, Alabama state colleges serve Blacks slightly better than Alabama community colleges. A value of 1.000 would indicate that both types of colleges enroll Blacks equally well.

The main conclusion to be drawn from Table 7 is that, among states, Blacks are more represented in community college systems (unweighted average of the state ratios) than in state college systems. On a national (weighted) basis, representation is nearly equal among state and community colleges. The high unweighted values of 1.381 and 1.244 are due in large part to the less than proportional enrollment of Blacks in state colleges of less populated states. Table 6 shows that Blacks are almost proportionally represented in community colleges, and so the values in Table 7 exceed 1.000 only by having the state college ratios less than the comparable values for community colleges. The weighted (national) averages indicate that Blacks are represented as well in state colleges as in community colleges. Presumably, large, urban states have Blacks overrepresented in

*State colleges were those defined as such by the Department of Education. They generally include public four-year colleges and some universities, excluding research universities and universities with large graduate components. The type of college included in this set may vary among states.

Table 7

REPRESENTATION OF BLACKS IN COMMUNITY COLLEGES RELATIVE TO THEIR REPRESENTATION IN STATE COLLEGES, BY SEX, 1978-79

	Sex	
	Male	Female
Alabama	.932	.962
Alaska	1.124	1.666
Arizona	3.333	4.330
Arkansas	1.000	1.110
California	.998	1.614
Colorado	1.235	.938
Connecticut	4.376	4.175
Delaware	.248	.385
Florida	1.909	2.284
Georgia	1.089	.910
Hawaii	2.000	2.000
Idaho	.800	.000
Illinois	1.018	.798
Indiana	3.604	1.709
Iowa	1.333	.500
Kansas	2.250	1.189
Kentucky	1.055	1.918
Louisiana	1.192	.812
Maine	-----	-----
Maryland	.623	.636
Massachusetts	.833	.929
Michigan	2.500	3.003
Minnesota	1.500	2.000
Mississippi	.583	.507
Missouri	2.542	3.345
Montana	.333	.133
Nebraska	1.251	.667
Nevada	1.570	1.274
New Hampshire	5.006	-----
New Jersey	1.821	1.668
New Mexico	.563	1.000
New York	.877	.828
North Carolina	-----	-----
North Dakota	.286	.233
Ohio	.824	1.090
Oklahoma	.898	1.051
Oregon	.750	.256
Pennsylvania	1.307	2.071
Rhode Island	.909	.737
South Carolina	1.451	.735
South Dakota	-----	-----
Tennessee	1.096	1.070

Table 7 (continued)

REPRESENTATION OF BLACKS IN COMMUNITY COLLEGES RELATIVE TO THEIR REPRESENTATION IN STATE COLLEGES, BY SEX, 1978-79

	Sex	
	Male	Female
Texas	1.139	1.040
Utah	.333	.167
Vermont	.000	.000
Virginia	.695	.679
Washington	2.169	1.500
West Virginia	.406	.400
Wisconsin	1.750	1.666
Wyoming	-----	-----
Average for the States (unweighted)	1.381	1.244
Average Weighted by Enrollment and Population	1.098	1.000

SOURCE: Compiled from 1978-79 HEGIS reports and 1970 Census data.

their state colleges, offsetting the more than proportional representation in community colleges of Blacks among small, less urban states. Half of the state community college systems (27 for Black males and 23 for Black females) have ratios equal to or greater than 1.000. The other half of the states have greater representation of Blacks at state colleges than at community colleges.

Interpretation of the data in Table 7 can be ambiguous because it represents only one point in time. The ratio for any state should be linked to the changes in higher education integration that are occurring in that state. For example, an initially encouraging sign of racial integration would be a high ratio, as minorities enroll in community colleges. At a more advanced stage of integration, an indication of progress would be a decline in the value of the ratio as more minorities entered other levels of the higher education system.

Table 7 also indicates that for some states the variation in attraction among Blacks for a community college or state college differs by sex. In eleven states the overrepresentation or underrepresentation of Blacks in community colleges relative to state colleges is reversed for males and females. That is, if Black males in one of the eleven states were overrepresented, then Black females were underrepresented in that state. Furthermore, among the eleven states with disparities it appears that Black males are attracted to community colleges more than Black females. Seven of the eleven states have overrepresentation of males and underrepresentation of females. Three (Iowa, Nebraska and South

Carolina) of the seven states have ratios that differ between males and females by at least a 2 to 1 margin. Because of the "layered" construction of the ratio, Appendix A gives a disaggregation of the ratios to their basic components for these three states.

An explanation for sex disparities in enrollment patterns is speculative, but several factors may be involved. First, a bias may exist by omitting other institutions from the analysis. The information is based on students attending community colleges or state colleges. Excluded are public universities and all private institutions. If Anglo men dominantly attend public universities or private institutions, then the representation ratios for Black men will be raised above what it would be if Anglo men attended community and state colleges to the same extent they attend other institutions.

A second possible cause of the enrollment patterns may be the distribution of institutions and people within a state. This analysis is based on state-level data. An implicit assumption of using state-level information is that the distribution of institutions and minorities is uniform across the state. In actuality, minorities may be concentrated in metropolitan areas, and community colleges may or may not be concentrated in the same areas. Consequently, community colleges may not be equally accessible to all sectors of the population.

An additional factor that affects enrollment is the economic and employment status of an individual. Wealth may be correlated with race to a large extent and affect choice of institution

because of financial considerations. Black men, on average have less wealth and need to work more to pay for their education than Anglos. Consequently, community colleges may be a more appealing option or the only viable option for many Black men.

Finally, occupational orientation may also affect enrollment patterns. Many occupations are still stereotyped by social class or sex. Community colleges specializing in certain vocational programs could affect enrollment patterns.

Student Costs

Evaluating access in terms of student costs is appealing in that the use of a small number of figures to indicate access is so tidy. However, the conciseness of the figures obscures many measurement problems. Elements included in the student's budget may vary. Some costs, such as for food or automobile insurance, an individual is likely to incur whether he or she attends college or not. Foregone earnings are a cost but are not included in a student's budget. Ability to pay is not easily measured. There is no agreed upon mechanism for equating income and assets to ability to pay. The relationship probably should change for individuals of different ages. Financial aid that includes varying mixtures of grants, loans and work earnings is not easily equated equitably. In examining the student costs at different types of institutions, it is unclear how the value of the educational experience at one type of institution should be compared with that of another. The unit of analysis may be the student or may be the student's family. All of these issues are

important. When student costs are used to assess financial access, these considerations are often overlooked, which can result in drawing erroneous conclusions. The main purpose of this section is to present information on tuition and fee charges, student budgets and net costs and, where possible, on students of different incomes attending community colleges as well as other colleges.

Although student financial aid provides assistance to targeted groups, assistance has become widespread. Students among all but the wealthiest attending all types of higher education institutions receive financial assistance. Three-fourths of all students expect to receive some form of financial aid. The benefit to a student may be viewed as providing access, choice or general financial relief. Since the focus here is on the community college student net price (cost of attendance minus available student financial aid and parental contribution), two main perspectives are of interest. One is the degree to which the net price for community college attendance is similar for students with different incomes. The other is the degree to which the net price at community colleges is similar to the net price at other colleges and universities.

National Level Analysis

In terms of the percentage of the cost of attendance that a student actually pays to attend (savings, loans and work earnings), costs are fairly similar for students with varying family income attending community colleges. In 1978, about one-third of the community college cost of attendance was paid by

both the high- and low-income dependent student. Middle income students paid a slightly higher percentage of the cost of attendance (Hyde, 1979). Among aid recipients at community colleges, the percentage of costs paid by the student (loans, work and unpackaged need) varied more widely from 50 percent for low income students to both larger and smaller percentages for students in higher income categories (Puma, et al., 1980).

In terms of actual dollars paid to attend, cost of attendance rises with family income. Estimates of the increase in student budgets for high income students are from 10 percent (Hyde, 1979) to 50 percent (Puma, et al., 1980) more than for low income students. The increase in costs is due to the choice among higher income students of colleges with higher tuition and fees but also to the greater associated costs of attendance for higher income students, which may not be necessary costs of attendance but, rather, reflect a different style of life.

A comparison of costs at community colleges and public four-year institutions shows that the cost of attendance at public four-year institutions ($3,900) is about 20 percent more expensive on average than the cost of attendance at community colleges (3,200). For low-income (family income less than $6,000) students, however, the difference in the cost of attendance is only $100. Receipt of student financial aid alters the costs. For recipients average net price at a public four-year college is less ($700) than the net price at a public two-year college ($1,200), because of the greater availability of aid at four-year colleges (Puma, et al., 1980).

This situation, however, does not persist for aid recipients of higher family incomes. One reason is that the cost of attendance at four-year institutions rises faster with student family income than it does for students at community colleges. The public four-year institution student budget for a dependent aid recipient with a family income of $20,000 is about 50 percent greater than it is for the student with an income less than $6,000. Among community colleges, the comparable increase is only about 20 percent. Second, the average amount of self-support more than doubles over this range among aid recipients at public four-year institutions but drops slightly for aid recipients at community colleges (Puma, et al., 1980).

While a student is expected to pay more, regardless of income, for a more expensive education, the result for very low-income students runs counter to the anticipated outcome. The general expectation is that net price for aid recipients will be reduced below the cost of attendance generally in proportion to cost. Presumably, the average net price at public four-year institutions should still be more than the net price at community colleges. The situation reported for very low-income students appears to be an aberration.

State Level Analysis

In Table 8 average tuition and fees, student budgets and net costs are compared between community and state college within each state. The purpose is to identify and examine general conditions about state systems of community colleges rather than to look at particular states. In fact, the figures for any given state

Table 8

TUITION AND FEES, STUDENT BUDGETS AND NET PRICES AT COMMUNITY AND STATE COLLEGES, 1978-79

	Tuition and Fees				Student Budgets				Net Prices			
	(1) Community Colleges	(2) State Colleges	(3) Dollar Difference (2)-(1)	(4) Percentage Difference, (3)/(1) x100	(5) Community Colleges	(6) State Colleges	(7) Dollar Difference (6)-(5)	(8) Percentage Difference (7)/(5) x100	(9) Community Colleges	(10) State Colleges	(11) Dollar Difference (10)-(9)	(12) Percentage Difference (11)/(9) x100
Alabama	234	592	358	153.1	1989	2239	250	12.6	1652[d]	2149[a]	496	30.0
Alaska	321	320	-1	-0.3	2341	2376	35	1.5	1814[d]	2361[c]	547	30.1
Arizona	127	500	373	293.7	1995	2168	173	8.7	1680	1974[d]	293	17.4
Arkansas	276	465	189	68.5	1428	2134	706	49.4	1160	1992[a]	831	71.6
California	6	200	194	3238.2	2231	2218	-13	-0.6	2087	2145[a]	59	2.8
Colorado	391	625	234	59.8	2071	2736	665	32.1	1786	2462	675	37.8
Connecticut	345	696	351	101.8	2572	2655	83	3.2	2385	2505[a]	120	5.0
Delaware	504	440	-64	-12.7	2214	2526	312	14.1	1999	1827[a]	-172	-8.6
Florida	395	760	365	92.5	2073	2905	832	40.1	1838	2746[d]	908	49.4
Georgia	371	572	201	54.2	1911	2343	432	22.6	1617	2120	503	31.1
Hawaii	80	333	253	316.2	2356	2444	88	3.7	2228	2320[e]	92	4.1
Idaho	384	411	27	7.1	1978	2170	192	9.7	1589	1874	286	18.0
Illinois	420	696	276	65.8	2830	3005	175	6.2	2577	2580[d]	3	0.1
Indiana	602	800	198	32.9	1707	2325	618	36.2	1431[a]	2287[c]	856	59.9
Iowa	500	694	194	38.8	2124	2520	396	18.6	1881	2387	506	26.9
Kansas	387	597	210	54.2	1766	2783	1017	57.6	1456	2623[a]	1167	80.1
Kentucky	390	489	99	25.4	----	2325	----	----	----	2141	----	----
Louisiana	303	461	158	52.0	----	2205	----	----	----	2078[a]	----	----
Maine	588	---	---	----	2785	----	----	----	2168	----	----	----
Maryland	482	763	281	58.2	2564	2362	-202	-7.9	2303	2008	-295	-12.8
Massachusetts	380	641	261	68.6	2312	3046	734	31.7	2005	2764	759	37.8
Michigan	446	825	379	84.9	2649	2657	8	0.3	2414	2395	-19	-0.8
Minnesota	564	630	66	11.7	2574	2354	-220	-8.6	2085	2028[b]	-58	-2.8
Mississippi	287	600	313	109.2	1737	2222	485	27.9	1389[a]	1882[a]	492	35.4
Missouri	417	367	-50	-12.0	2408	2123	-285	-11.8	2126	1928	-198	-9.3
Montana	283	492	209	73.7	2462	2657	195	7.9	2011[a]	2207	196	9.8
Nebraska	438	710	272	62.0	2122	2466	344	16.2	1920	2263	344	17.9
Nevada	404	721	316	78.2	2084	1810	-274	-13.2	1939	1634[d]	-305	-15.7
New Hampshire	513	947	434	84.5	2577	2863	286	11.1	2344	2031[a]	-313	-13.3
New Jersey	523	873	350	67.0	2391	2844	453	18.9	2136[a]	2609[a]	473	22.2
New Mexico	325	447	122	37.5	1914	2879	965	50.4	1598	2652[c]	1054	66.0
New York	776	890	114	14.7	2479	2843	364	14.7	1859	2089	231	12.4
North Carolina	131	---	---	----	1997	----	----	----	1807	----	----	----
North Dakota	515	479	-36	-7.1	1399	2239	840	60.1	544	1351	807	148.5
Ohio	617	889	272	44.1	2252	2613	361	16.0	1846	2512[a]	666	36.1
Oklahoma	305	408	103	33.7	1959	2353	394	20.1	1696[a]	2252[a]	557	32.9
Oregon	379	773	394	103.9	2569	3322	753	29.3	2256	3009[a]	753	33.4

Table 8 (continued)

TUITION AND FEES, STUDENT BUDGETS AND NET PRICES AT COMMUNITY AND STATE COLLEGES, 1978-79

	Tuition and Fees				Student Budgets				Net Prices			
	(1) Community Colleges	(2) State Colleges	(3) Dollar Difference (2)-(1)	(4) Percentage Difference (3)/(1) x100	(5) Community Colleges	(6) State Colleges	(7) Dollar Difference (6)-(5)	(8) Percentage Difference (7)/(5) x100	(9) Community Colleges	(10) State Colleges	(11) Dollar Difference (10)-(9)	(12) Percentage Difference (11)/(9) x100
Pennsylvania	593	1056	463	78.1	2462	2517	55	2.2	2048	1689[a]	-359	-17.5
Rhode Island	431	684	253	58.7	----	2656	----	----	----	2315[a]	----	----
South Carolina	347	627	280	80.6	2415	2414	-1	0.0	2169	1934	-235	-10.9
South Dakota	---	812	---	----	----	2483	----	----	----	1634[b]	----	----
Tennessee	253	448	195	77.0	1719	2134	415	24.1	1451	1899[d]	448	30.9
Texas	220	347	127	57.9	2260	2543	283	12.5	2055	2422[d]	367	17.9
Utah	442	553	111	25.2	1786	2876	1090	61.0	1607	2626	1019	63.4
Vermont	574	765	191	33.3	1922	3096	1174	61.1	1177	2429	1252	106.3
Virginia	303	812	509	168.1	2227	2600	373	16.8	2068	2397[a]	329	15.9
Washington	301	618	317	105.3	2498	2582	84	3.4	2309	2285[a]	-24	-1.0
West Virginia	311	356	45	14.5	1936	2130	194	10.0	1580	1687	107	6.8
Wisconsin	374	786	412	110.1	2146	2586	440	20.5	1688	2462[c]	774	45.9
Wyoming	281	---	---	-----	1736	----	----	----	1598	-----	----	----
Median for the States	$384	$618	$222	64.5	$2180	$2517	$344	16.0	$1870	$2252	$448	18.0

[a]No state aid data included; only BEOG and campus-based aid were subtracted from average student budget.

[b]Only partial state aid data were available; net cost reflects only the amount reported.

[c]Net cost reflects student budget less campus-based aid only; information on BEOG and state financial aid were not available or of poor quality.

[d]Net cost reflects student budget less campus-based aid and state aid; information on BEOG was not reported or not available.

[e]Net cost reflects student budget less BEOG and state aid; no campus-based aid data were available.

SOURCE: HEGIS financial and enrollment data were used for calculating tuition and fees. Data from the College Scholarship Service of the College Board plus HEGIS data were used for calculating student budgets. Additional information from various sources on student financial aid programs was used to calculate net prices.

should not be taken too seriously. Some, perhaps key, institutions may have been omitted because of lack of data. An institution may be included in one state while a similar kind of institution in another state is not. These are matters over which reasonable persons could easily disagree. Overall, it is assumed that the various flaws in the data are distributed throughout the data and do not appear in any systematic way.

In 1978-79, median tuition and fees among states at community colleges were $384; they were $619 for state colleges. While the state colleges charged on average over 60 percent more than community colleges, there was considerable overlap. Twelve states had community colleges that charged on average $500 or more for tuition and fees, and 17 states had state colleges that charged an average of $500 or less for tuition and fees. These differences reflect state policies of tuition pricing and possible underlying differences in educational expenditures per student by the institution. They may be combined with student aid policies that might modify conclusions drawn solely from tuition and fee data.

The tendency among states is for tuition and fee levels to move together. If average tuition and fees are high in state colleges, they tend to be high in the community colleges as well. The simple correlation coefficient for tuition and fees at community colleges and at state colleges is .69. In some states, the dollar difference between the two sectors is quite small. Eight states had a tuition and fee difference between the sectors of less than $100.

Information on average student budgets and net prices are

also given in Table 8. The median state community college budget for a student is $2,180, and the median budget for a student attending a state college is $2,517. The median difference, $344, reflects mostly the difference in tuition and fees. The nontuition portion of the student budget is fairly stable, but because of its large size it reduces the importance that a difference in tuition may make in the student budget. While the median dollar difference between student budgets is $344, that constitutes only a 16 percent increase of the median state college student budget over the median budget of a community college student. Within many states the difference is less. Of 43 states for which information is given for both institutional sectors, 13 states have average student budgets for attendance at state colleges that do not exceed by $100 the average student budget at their community colleges. An additional five states are within $200. For students in these states, the cost of attendance is so similar between community and state colleges that financial access seems equally provided by both sectors and that choice of attendance can not be justified in terms of substantially greater direct costs of attendance.

The overlap between community and state colleges for student budgets is greater than for tuition and fees, although there is a strongly significant difference between budgets for the two sectors. Results of analysis of variance are a statistical technique for comparing the variation in values between sectors with the variation in values among institutions within each sector. These show that the distribution of tuition and fees

between community and state colleges is much more distinct (F = 44.7) than is the distribution of budgets (F = 26.1), although the differences between the sectors are highly significant for both factors.

The distinction between the variation in tuition and fees and the variation in budgets may seem to be counter intuitive. Maintenance costs, board and room, books, supplies and transportation are fairly stable while tuition and fee costs vary substantially. This situation leads one to think of the cost of attendance as simply tuition and fees inflated by a constant factor which, when discussing averages, is a fair generalization. However, budgets, which are several times the size of tuition and fee charges, especially for community colleges, need to vary by only a small percentage to have the dollar equivalent of that percentage equal the full dollar amount of tuition and fees. Consequently, there may be less distinction between community and state colleges in the variation in budgets than for tuition and fees.

The effect that the distribution of student financial aid has on differences in student costs between community and state colleges is difficult to assess because measurement is imprecise. The extent to which student costs are reduced by financial aid is ambiguous because (1) aid is not provided to all students, (2) some students are eligible for some aid programs and not others, (3) the value of a dollar of aid depends upon whether it is a grant, loan or work earnings and (4) accounting practices generally involve tallying the number of aid recipients within a

program and their award amounts; unduplicated counts among programs are not often made.

The lack of comprehensive, detailed data about aid distribution among students results in estimates of net price being approximated in various ways. In this analysis financial aid is assumed to be distributed equally among all students. In actuality, aid is awarded largely to low-income students so that the estimates presented here understate the actual average amount of aid received by recipients. However, financial aid appears to promote access at state colleges as well as at community colleges. In fact, budgets differ by only a few hundred dollars although community college students on average have lower incomes (Astin, et al., [1978], and Hyde, 1980c). Therefore, a needy student at a state college might receive more financial aid than he or she would at a community college. It is plausible that financial aid awarded to community college students is allocated in such a way that more students receive awards, but of smaller amounts. If this is the case, then financial access and choice is made more available at state colleges.

The degree of overlap for net prices is no greater than for student budgets. While 18 states had in 1978-79 state college student budgets that exceeded community college student budgets by less than $200, 15 states were in this same situation with respect to their net prices. Analysis of variance also shows that student financial aid reduces the student cost distinction between community colleges and state colleges very slightly (the F value drops from 26.1 for the student budgets to 22.2 for student net

prices). Ideally, as evidence of the effectiveness of student aid, one would like the analysis of variance results to show a substantial difference between the distribution of student budgets and net prices. If the significance of the analysis of variance were much less for net prices than for student budgets, that would be evidence of the effectiveness of the distribution of student financial aid in reducing cost differences between the two sectors. The very modest reduction in this instance is perhaps expected; the initial difference in average budgets is only $346.

When the distribution of aid is examined over a full range of institutions, including public and private institutions, data show that the distribution of financial aid is more successful in diminishing initial student cost differences among institutional sectors. For example, the very low-income student attending a private four-year institution has a net price (including all forms of aid) of only slightly over $800 to attend a college that costs nearly $5,000. The same student would pay only slightly less (a little under $600) to attend a pubic two-year institution with a student budget of a little more than $2,300 (calculated from Puma, et al., 1980, 6.15 and 6.17).

Another way of assessing the degree of access achieved through modification of student costs is to examine the changes that have occurred over time. The average tuition and fees, average student budgets and average net prices in state and community colleges are given in Table 9 for 1972-73 and 1978-79. (State averages for 1972-73 are given in Appendix B but are not reliable, especially the net price figures, because of the

Table 9

COMPARISON OF TUITION AND FEES,
THE STUDENT BUDGET AND NET PRICE BETWEEN
COMMUNITY COLLEGES AND STATE COLLEGES, 1972-73 AND 1978-79

	Community Colleges		State Colleges	
	1972-73	1978-79	1972-73	1978-79
Tuition and Fees	$ 376	$ 384	$ 462	$ 616
Student Budget	$1,583	$2,174	$1,754	$2,518
Net Price	$1,499	$1,856	$1,579	$2,212

SOURCE: HEGIS financial and enrollment data were used for calculating tuition and fees. Data from the College Scholarship Service of the College Board plus HEGIS data were used for calculating student budgets. Additional information from various sources on student financial aid programs was used to calculate net prices.

frequency of missing or incomplete data on student financial aid.)

A primary objective of states has been to keep community college tuition and fees low to promote access, and aggregate data for 1972-73 and 1978-79 indicate that tuition and fee charges at the community colleges changed very little during this period. Average tuition and fees at community colleges increased by only $8, from $376 to $384. State college tuition increased on average from $462 to $616, a dramatic increase compared to the stability experienced by community colleges. Whether tuition among community colleges will be raised to bring it more in line with state college tuition will depend upon the role of the state legislature and the individual community college in setting tuition, state and community priorities and the importance of local tax contributions to community colleges.

In 1980, 19 states reported in a survey of state directors of community and junior colleges conducted by the Education Commission of the States that some explicit recognition is made in state policies of a concern to keep tuition and fees low in community colleges. Several other states indicated that an effort is made to keep tuition in community colleges lower than in other institutions. However, more recently developing fiscal constraints may erode the commitment to low tuition for community colleges. A study by the Western Interstate Commission on Higher Education reports that 17 states indexed tuition in 1980. Fourteen of these states indexed tuition to the cost of education, which is an increase since 1976 when only six states used this method. Five additional states are considering indexing tuition

and seven more are considering various alternatives, including indexing, for setting tuition (Western Interstate Commission, 1980).

With the percentage generally set at between one-fourth and one-third of variously defined education costs, the tuition charge will increase with the inflationary costs of education. Of those states that index tuition, several states also take into account tuition levels at other postsecondary educational institutions in choosing for the community colleges the percentages of costs to be assessed through tuition. While the percentage at community colleges has been deliberately set lower than for other institutions, Colorado is one state that raised the percentage of community college costs met with tuition from 20.0 to 25.0, which made the community college tuition policy comparable to the policy for the public four-year institutions. It is uncertain whether other states may adopt parity of tuition pricing between community colleges and other sectors.

The data in Table 9 also show the differences in student budgets and net prices and the changes that have occurred. The difference in the amount of the average student budget at community and state colleges largely reflects the difference in tuition and fees. In 1972-73, the difference in average tuition and fees between community and state colleges was $86, and the difference between budgets was $171. In 1978-79, the difference in average tuition and fees between community and state colleges increased to $232, because of the increase in state college tuitions, while the difference between budgets increased to $344.

The change between 1972-73 and 1978-79 in the amount that student financial aid reduced the student budget was substantial, showing a greater reduction for community colleges than state colleges. For community colleges, the difference between average net price and the average student budget was $84 in 1972-73 and increased to $318 in 1978-79. For state colleges, the 1972-73 difference was $175 and increased to $306 in 1978-79. These increases in the difference between student budget and net price were primarily the result of the massive infusion of federal student financial aid in addition to the expansion and establishment of state aid programs.

Whether the increase in aid going to community college students is comparable to the increase among students attending four-year colleges is uncertain. The data in Table 9 suggest that on a per student basis the infusion of aid has improved the situation of the community college student relative to the situation of the four-year college student. Breneman and Nelson (1981), however, show that the enrollment-based share of federal need based student financial aid at community colleges decreased between 1973-74 and 1979-80. Some of the difference might be explained by the different period of time examined; by the partial inclusion of state student financial aid in Table 9; by the way institutions are classified as community colleges and as public two-year institutions; and by the way enrollments are defined.

For several reasons, the distribution of financial aid among low-income students and among community colleges is more favorable than the data given in Table 9 indicate. First, generally

low-income students receive on average about twice the amount of aid indicated by a calculation of average aid among all students, and community colleges enroll more than a proportional share of low-income students. Second, tuition waivers, not included in Table 9, also probably are granted more frequently to community college students than to students in other institutions. This occurs because stipulations for granting a waiver usually include disadvantaged characteristics that are found more frequently among community college students. Some 22 states have community colleges that have the option of waiving tuition under certain circumstances. The most common category designated for waivers or reduction of tuition is senior citizens, but a few states have extensive categories. Texas has nine categories including high school graduates with the highest class ranking, high school graduates of state homes, veterans, disabled persons and children of prisoners of war. Washington has 16 categories of students eligible for waivers including many of the same categories as Texas.

Institution-Level Analysis

The state level data raise questions about the equity of the distribution of financial aid between community colleges and other colleges and about the comparability and significance of other factors that distinguish community colleges from other higher education institutions. An attempt to examine these questions by using institution-level data for community and state colleges follows. The data are from Texas, a state that has comprehensive information on the demographic characteristics of its students.

Texas has one of the lowest tuition policies of all the states. In 1978-79, the community colleges were the fifth least expensive and the state colleges were the fourth least expensive. Tuition and fees, however, are only one rather small element of the costs of attendance. The costs of board and room, transportation, books and supplies and miscellaneous expenses increase the costs by about $2,000 dollars so that tuition and fees constitute only 10 to 15 percent of the student budget. While the institution or state is able, through public policy, to affect directly the tuition and fee structure, it has no direct control over the remaining 85 to 90 percent of the student's budget. Through student financial aid, however, student costs can be reduced further, but measurement of that reduction is difficult.

The data available from Texas allow making two estimates that crudely bracket reasonable upper and lower <u>average</u> amounts of aid received by aid recipients. In actuality, some students receive substantial aid, some limited aid and others no aid. The data only provide the number of recipients and the total amount of aid received by those recipients. Furthermore, financial aid data seldom distinguish recipients of aid from one program from recipients of aid from another program. Consequently, a calculation of average aid based upon the sum of aid recipients among all aid programs underestimates the average amount of aid received by a recipient because many students receive aid from more than one aid program.

An estimate of an unduplicated count of recipients can be

approximated by the number of Pell Grant recipients (or the number of recipients in some other popular aid program). It is the most popular program and all students in Texas who seek financial aid are encouraged to apply for a Pell Grant before seeking other aid. This is one of the methods used to estimate average aid award per recipient. The total dollar amount of aid from all aid programs is divided by the number of recipients in whatever aid program is the most popular program at each college. This calculation provides an overestimate of the average amount of aid per recipient. The second approach -- calculating the average Pell Grant award per Pell Grant recipient -- underestimates the actual average amount. Thus, the two estimates provide a rough approximation of the range that occurs in average aid awards.

Information about the various student costs are given in Table 10. Based on 34 community college campuses and 17 state colleges for which complete data were available, average tuition and fees in 1978-79 were $263 at community colleges and $366 at state colleges. Two types of budgets were calculated. One was for the student residing on campus, or off campus but away from home if the college did not have on campus facilities, and one for the commuting student. The comparable budgets are very similar for the two types of institutions. The on-campus budget is nearly $3,000 at both community and state colleges and the commuter budget is about $2,400 for both types of colleges. The dollar differences are $18 and $11, respectively, or about half of one percent.

The most important observation is that the $103 lower

Table 10

STUDENT COSTS AT TEXAS COMMUNITY AND STATE COLLEGES, 1978-79[a]

Mean Values

	(1)	(2)	(3)	(4)	(5)	(6) Net Price			
	Tuition and Fees	Student Budget, Campus	Student Budget, Home	Student Financial Aid per Recipient	Average Pell Grant	(a) Col.2-Col.4	(b) Col.2-Col.5	(c) Col.3-Col.4	(d) Col.3-Col.5
Community Colleges	$263	$2,952	$2,383	$ 974	$587	$1,978	$2,365	$1,410	$1,796
State Colleges	$366	$2,970	$2,394	$1,616	$697	$1,355	$2,273	$ 778	$1,696
Analysis of Variance									
F-Value	17.929	.009	.005	33.751	22.993	6.518	.191	11.340	.449
Significance of F	.000	.925	.943	.000	.000	.014	.664	.002	.506

[a]The costs are for a full-time, dependent student.

SOURCE: Compiled from unpublished data of the Texas Higher Education Coordinating Board.

community college tuition and fees are obscured when the full cost of attendance is considered. The analysis of variance results, presented in the lower portion of the table, confirm this finding. The difference between tuition and fees for community colleges is significantly lower than for state colleges, but there is no significant difference between budgets. The similarity of student budgets between community and state colleges appears to refute the assertion that students choose to attend community colleges because they are less expensive. However, these data do not tell the entire story. Several other factors are of key importance.

One factor is that the data are slightly misleading because the situation involves noncomparables. More community college students live at home while attending than do state college students. Nationally, 95 percent of community college students and 65 percent of students at state colleges commute (Hyde, 1980a). Exact estimates are not available for Texas, but it seems reasonable to believe that the same discrepancy exists in Texas. The percentages of commuters at both community and state colleges may be lower than the national averages because of the greater distances for many students. Consequently, using a commuter budget for community college students may be more appropriate than it may be for students who attend state colleges and who more frequently live away from home. Some students have no choice.

If an individual lives in a town with a community college but no nearby state college, the option of commuting to a state college is not available. Thus the option of living on campus at a nearby community college would probably not be exercised by many

students. If students are willing to pay board and room for the experience of living on campus, most would presumably prefer attending a four-year institution or at least living away from home. The result is that a comparison of the budget for living at home for a community college student with the budget for living on campus for a state college student may be more appropriate than a comparison of the same type of budget for both kinds of colleges. The appropriateness of the choice of comparison depends upon a student's options. The budget comparison mentioned above is appropriate if the prospective student views his or her options as attending either a state college and living on campus or a community college and living at home. In such a case, the student would choose between paying $2,383 to live at home to attend a community college or paying $2,970 to attend a state college away from home.

Another factor influencing a student's financial situation but not reflected in the data shown in Table 10 is that many students work while attending college, causing a large discrepancy between community and state colleges in the percentage of students who work. National data show that half of lower division, full-time community college students work. The comparable percentage for students at public four-year institutions is 31 percent. Among part-time, lower division students, the percentages are higher, but the percentage is still greater for community college students than for students at state colleges (Hyde, 1980).

Presumably these data are reasonably applicable in Texas.

Assuming that a student is more likely to work if he or she lives at home than if living on campus, a larger share of community college students supplement their income with work earnings than do students at state colleges. (It may be more to the point to say that students may choose to live at home and attend a community college so that they can work.) The average difference of $587 between the commuting budget for a community college student and a student living on campus at a state college seems less important when compared with several thousand dollars that a student might realize by working. However, while the working student's income may be used to meet his or her financial needs, the earnings do not alter the budget. The working community college student gives labor to earn his or her income. The nonworking student is free to use that same amount of time pursuing other activities that may provide a richer college experience.

A third factor important to an examination of student costs is the method used to calculate student budgets. Some costs would be incurred regardless of whether the individual attends college. The relevant cost in terms of affecting a student's enrollment decision is the additional cost incurred to attend college; yet the calculation of the student budget often includes the full cost. In short, because of the differences in the commuting and resident student budgets, use of a marginal cost of attendance, which is the appropriate measure for public policy considerations, would tend to widen the relative student budget dollar difference between community and state colleges.

These three factors -- the actual institutional choices available to students and the larger proportion of commuters among community colleges, the greater likelihood of working among community college students and consideration of marginal costs of attendance -- indicate that viable student choices between community and state colleges involve more economic considerations than indicated by the budget information in Table 10. However, the analysis does show that the direct student costs of attendance are similar for both community and state colleges and that the lower tuition and fee costs at community colleges are obscured when the full, conventional student budget is considered. Probably less than half of all students actually pay the amounts stated in columns 2 and 3 of Table 10 because they receive student financial aid.

As already stated, the distribution of aid among students can not be estimated with the data available, but two estimates were made of the average amount of aid per recipient. One estimate is defined in such a way as to produce an overestimate (column 4); and the other to produce an underestimate (column 5), although particular individuals receive awards of amounts smaller and larger than either of these estimates.

The surprising finding in Table 10 is that, by either estimate of average aid, state college students receive more aid than community college students. Since the student budgets are practically the same, it appears that aid recipients at state colleges pay less to attend than aid recipients at community colleges. This situation could be justified as equitable if

students at state colleges have greater financial need because of lower ability to pay. However, community college students have on average lower incomes than other students.

One other possibility that could explain the greater aid to state college students would be more state college students living on campus, and having a higher budget, than community college students. While this is true, there is not sufficient information to determine how much of the aid is distributed to students living at home and how much to students living away from home. Although it is not correct, one could assume for estimation purposes that all community college student aid goes to students living at home. This represent the smaller budget and presumably a smaller amount of need. One could also assume that all state college student aid goes to students who live on campus and who have larger budgets and more need.

Under these hypothetical conditions the net price (the student budget minus financial aid) is still greater for community colleges ($1,410) than for state colleges ($1,355). (Compare column 6(c) with column 6(a).) Using more "comparable" budget and financial aid data, the differences are even larger. For example, if on-campus budgets with aid are used, the state college net price is over $600 less than the community college net price. Calculations for other combinations are also given in column 6.

While it is often thought that students attend a community college because it is less expensive, the information presented here suggests that the direct costs of attendance and the amount the student pays in Texas at community and state colleges are

comparable. Students in Texas presumably select community colleges for other reasons, some of which may be economic considerations not reflected in conventional student budget information.

A final factor that affects the conclusion drawn about the equity of the financial aid received by community colleges is the choice of the unit of observation. Table 11 shows that the average dependent student's share of costs is 37.9 percent for community college students but 32.6 percent for students at public four-year institutions. It is even less for students at private institutions. The contribution of parents of community college students, however, is less than for other sectors. What appears to happen is that the student makes up for what the parents do not provide; the grant component is the same for public four-year and two-year colleges.

On the one hand, if the unit of observation is the family, then the community college student is no worse off than students at public four-year institutions, that is, he or she receives the same proportion of grant aid as students at public four-year institutions. On the other hand, if the unit of observation is that of the student, the community college student pays a larger proportion of his or her costs, than do students attending elsewhere, and should receive more grant aid.

In sum, the collective weight of a review of access indicates that much has been accomplished. More minorities participate in higher education than 30 years ago; student costs have been reduced, especially for low-income students; more people have an

Table 11

RESOURCE COMPOSITION OF THE DIRECT COST OF ATTENDANCE TO THE STUDENT, FOR DEPENDENT STUDENTS BY INSTITUTIONAL SECTOR, FALL 1978

	Institutional Sector				
	Public Four-Year	Public Two-Year	Private four-Year	Private Two-Year	All Sectors
Parental Contribution	37.8	32.5	37.4	36.5	37.1
Student Contribution[a]	32.6	37.5	27.5	25.8	32.6
Grants	29.6	29.6	35.1	37.7	30.3

[a]Components of the student contribution are student's savings and earnings and loans, net of their grant portion.

SOURCE: William Hyde. The Equity of the Distribution of Student Financial Aid, Education Commission of the States, Denver, Colo., 1979, p. 34.

interest in attending college than previously. The exact significance of these accomplishments, however, are open to criticism. Lack of data and measurement difficulties can always be a defense for the skeptic who seeks definitive answers, but there are no definitive answers. Furthermore, one will always be able to identify some degree of inequality. Complete equality is not feasible. The perpetual issue is finding a politically acceptable balance.

III. THE LIMITS OF ACCESS

The amount of access achieved by public policy depends upon the degree to which access can be altered by such policies and by government's ability to support those policies. A large number of factors influence access. Only a few of them offer appropriate opportunities for policy intervention. Modification of student costs through student and institution subsidies has been a primary strategy for several years of state and federal government.

However, there are education variables outside the postsecondary education arena that affect access, such as high school perfomance. Other variables, such as labor market conditions, are noneducation policy variables that influence attendance. Still other variables are considered altogether beyond the scope of public policy. For example, family background is an important determinant of an individual's college attendance, and yet it is not subject to public policy manipulation. An assessment of the potential of various factors to modify decisions about college attendance should be made with all key policy and nonpolicy variables included in the analysis.

In the last 15 years over 40 published studies have dealt with factors influencing enrollments. Several times this number of studies emerged on related issues of the equity of access or opportunity and the distribution of costs and benefits. Yet, it is difficult for a policy maker to know what conclusion to draw from this literature because the studies seldom address the total issue. The studies address different concerns. Some are sociological in origin, explaining the importance of socioeconomic

variables for attendance. Others are economic in perspective, examining the importance of costs and returns on an individual's decision to attend. Some studies focus on particular variables such as transportation costs or institution location. Others examine all of higher education; only a few focus on community colleges (see, for example, Berne, 1977 and Sulock, 1976). However, only in a model that includes all relevant policy and nonpolicy variables can a proper context for the influence and limitations of policy be assessed. Of course, perfect or near perfect specification of all key factors that influence an individual's enrollment decision and an accurate specification of a model that reflects the human decision making process are beyond the current state of the art and beyond practical limits of data collection.

A full specification of variables influencing an individual's decision to attend would include but would not be limited to costs of tuition and attendance and foregone earnings; benefits of expected future earnings and other conditions of employment; geographical proximity of institutions; the social and educational milieu of the institutions and the social and psychic comfort of the individual in the institution; the attendance behavior of an individual's peers and neighbors; high school preparation; individual and parental traits of ability, motivation and disposition; the socioeconomic and demographic characteristics of the individual; the scope of institutional program offerings, scheduling and quality; and availability of student support services. Furthermore, not all of these factors have a similar

effect on individuals. For example, distance to an institution is generally negatively associated with likelihood of attendance, and yet some individuals prefer attendance away from home and are less likely than others to attend the nearest institution (Hyde and Augenblick, 1980).

With empirical estimates based on a wide range of statistical models portraying an individual's enrollment behavior, each with a different set of variables, results from various studies often seem contradictory to a casual observer. Little wonder that state policy makers are in a quandry regarding what they should do. Several states concerned about the effect on enrollment of raising tuition levels have undertaken studies that show no negative relation, and possibly even a positive relation, between tuition and enrollment. However, to conclude that tuition has no effect or a positive effect on enrollments is erroneous. Tuition as a price clearly has a negative effect on demand. The issue is the extent of the effect of tuition on enrollment and the accuracy of measuring the effect.

Tuition is an important higher education policy variable. In the context of all institutional and governmental policy and nonpolicy variables, however, the importance of tuition may be overshadowed by more important factors. Furthermore, the accurate measurement of its effect may be difficult because of the incomplete nature of the model. For example, a key element of education that often goes undocumented in studies of the effect of tuition changes on enrollment is the quality or nature of education. Because of the difficulty of defining and measuring

the outcomes of education, studies generally assume that the quality or product being produced is constant, which may or may not be the case. If the quality of programs or program diversity is improved at the same time tuition is raised, enrollments may increase. Unfortunately, in these circumstances it is difficult to separate the effect of the change in education programs on enrollment from the effect of the change in tuition. In the absence of a measure to account for possible changes in education programs, or any other factor that influences enrollments, attribution of enrollment change to changes in tuition may be overstated or understated.

In the analysis reported here of variables influencing community college attendance five sets of factors are identified to explain variation in college attendance. They are individual background characteristics, high school preparation, individual disposition toward and knowledge of postsecondary education, labor market conditions and the individual's higher education environment. The measures available for these variables and the analyses are presented in Appendix C. The purpose of this chapter is to discuss the importance of various policy and nonpolicy variables.

The results of analysis undertaken in this study are generally consistent with results of other broad scope studies. Socioeconomic background and high school preparation have larger influences on attendance for conventional college-aged youth than higher education policies.

The most significant variables for influencing community

college attendance when the option is not to attend at all are the college-going rate of one's peers and enrollment in an academic high school curriculum. The extent to which these two variables may be influenced by education policies is questionable. Path analysis shows that high school variables capture much of the explanatory power of individual background variables (Munroe, 1981). An individual who enrolls in an academic high school curriculum probably already has aspirations and plans for attending college that are formed by his or her family. The college-going rate of one's peers also reflects the socioeconomic status of the individual's neighborhood as well as of the individual. This is applicable to the extent that people choose to live in homogenous neighborhoods.

The analysis of the decision to attend a community college or to attend some other postsecondary institution yields similar results regarding the importance of nonpolicy and nonhigher education policy variables in influencing attendance decisions. The most important determinant of type of college attended is high school grade point average, followed by socioeconomic status (SES) and enrollment in an academic high school curriculum. All three of these variables are negatively related to community college attendance. Higher SES students and better prepared students are more likely to attend a four-year college than a community college.

One of the unique findings regarding the determinants of community college enrollments vis a vis higher education in general is the importance of SES. SES appears to have a strong

positive effect on enrollment when the context of the analysis is all of higher education. However, when a distinction is made between community colleges and other higher education institutions, SES is not an important determinant of attendance at community colleges among students deciding on whether or not to attend. Socioeconomic status is, however, an important determinant of institutional choice. This distinction lends support to the contention, expressed in the discussion of the definition of access in Chapter I, that the meaning of equal access should take into account different types of institutions because different types of institutions convey varying images to prospective students.

The Importance of Student Costs

Perhaps the most discussed higher education policy variables are those of tuition and fees, student cost of attendance and student financial aid. The popularity of these measures is due to their high visibility in the policy arena and easier measurement of their effectiveness in dollar terms than most other variables. Results in this analysis are consistent with results from other studies. An increase in student costs at community colleges decreases the likelihood of attendance.

Several estimates of the sensitivity of the enrollments to the cost of attendance were calculated as a part of the project. The results are given in Table 12. Implied tuition elasticities are given in parentheses. All of the estimates show that enrollment is negatively related to the cost of attendance although only the elasticities in the second and third columns are based on statistically significant

Table 12

PERCENTAGES OF ENROLLMENT CHANGES FOR A ONE PERCENT CHANGE IN THE COST OF ATTENDANCE AT COMMUNITY COLLEGES

	Choice Between Attending Community College and Not Attending At All	Choice Between Attending Community College and Attending Public Four-Year Institution	Choice Between Attending Community College and Attending Any Other Institution[1]
All Individuals	-1.9 (-0.32)	-1.5 (-0.25)	-3.2 (-0.53)
Low SES Individuals[2]	-2.3 (-0.38)	-2.1 (-0.35)	-3.8 (-0.63)

[1]Includes public four-year institutions.

[2]Includes those individuals whose SES index value did not exceed the mean value by more than one-half a standard deviation.

NOTE: Figures in parentheses are implied tuition elasticities based on average tuition and fees of $369 at community colleges and a commuter student budget of $2,829 (College Board, 1981).

regression coefficients. If the community college average cost of attendance is increased by one percent enrollments will decline by 1.9 percent. For those choosing between a community college and a public four-year institution, the expected change is 1.5 percent. It is 3.2 percent if all other postsecondary education options are included. This suggests that a one-percent increase in the community college average cost of attendance will result in 1.5 percent of the students preferring to attend a public four-year institution and another 1.7 percent preferring to attend a private institution or a public university. Since there are three undergraduate students attending private institutions or public universities for every two undergraduate students attending public four-year colleges, the enrollment shift is more heavily directed toward the public four-year sector. Tuition elasticities in all instances are close to one-sixth the value for the cost elasticities.

A set of cost elasticities was also calculated for individuals with low SES. In all instances these individuals were more sensitive than the average individual to changes in student costs, as has been reported elsewhere (Bishop, 1975, California Postsecondary Education Commission, 1980, and Jackson, 1977). For those choosing between community college attendance and no attendance at all, a one-percent increase in cost, with other costs held the same, results in a 2.3 percent decline in enrollments. Among those choosing between a community college and a public four-year college, the percentage is 2.1, and it is 3.8 percent when all other institutions are included. More than half

the potential enrollment shift would be to public four-year colleges for low SES individuals while less than half of all individuals affected, regardless of SES, would make the same change. In sum, these results suggest that individuals considering community college attendance are responsive to changes in community college student costs. Also, students and prospective students view four-year public institutions as closer substitutes for community colleges than other postsecondary education institutions and would have a bigger impact on their enrollments if community college costs were raised. The effect on students of lower socioeconomic status is more pronounced by about 20 to 40 percent.

As this study generally confirms and refines estimates of other studies, the body of empirical evidence appears reasonably consistent. One other study of the effect of tuition on enrollment deserves particular mention because of its simple and unequivocal design and unambiguous results.

Virtually all tuition studies estimate the effect of a change in tuition on enrollment by examining what individuals would do, given a range of different tuitions and institutions. However, a change in tuition and changes in enrollment do not actually occur; researchers only infer changes from the statistical model. In the following study (Stampen, 1974, and University of Wisconsin, 1981), tuition was actually altered and changes in enrollment observed. In 1972 the Wisconsin Board of Regents undertook an experiment in tuition-pricing policy to see what would happen to enrollments. Although Wisconsin does not have community colleges

per se, they have two types of institutions t `t serve the same functions that community colleges often serve in other states. One is a two-year vocational technical institute and the other is a two-year academic center that serves largely the transfer and general curricular function of community colleges elsewhere. These are 14 centers, with 7 located in urban or suburban areas and 7 in rural areas.

The experiment consisted of lowering tuition in one of the rural centers and in one of the urban centers for a period of three years after which the tuition was restored to a level comparable with the other centers. No other major changes -- such as programmatic changes or admission policies -- were made during this time. Beginning in the fall of 1973, tuition and fees at the two experimental centers were reduced substantially. Tuition and fees at the rural center were reduced from $515 to $180, and enrollment increased 30 percent. Tuition and fees at the suburban center were reduced from $476 to $150; enrollments increased by 55 percent.

Initially one might have reservations about the interpretation of the results of this experiment. The observed increase in enrollments might have occurred because of new students matriculating. It also might have resulted from existing students substituting attendance at a center with lowered tuition for attendance at some other higher education instutition. Enrollment tallies and circumstantial evidence of the change in the characteristics of students suggests that most of the increase in enrollments consisted of new students or students reentering

college.

The entire University of Wisconsin (UW) higher education system grew in enrollments by an average of 5.0 percent between the three years preceding the experiment and the three years of the experiment. Among the 12 centers that did not alter tuition, the average change in enrollments between these two periods was 12.9 percent, as shown in Table 13.

Table 13

Percentage Change in Enrollments: Wisconsin Experiment

	From Preexperimental Period (1970-72) to Experimental Period (1973-75)	From Experimental Period (1973-75) to Postexperimental Period (1976-78)
UW System	5.0	4.5
12 nonexperimental centers	12.9	9.2
Rural experimental center	30.3	-17.7
Suburban experimental center	54.9	-24.2

For the experimental centers the percentage increases were much larger, 30.3 percent for the rural center and 54.9 percent for the suburban center. The greater rate of increase for the suburban center would be expected since more higher education institutions were located in the vicinity from which the experimental center might draw enrollments. When the tuition experiment was ended, enrollments at the two experimental centers

declined at about half the rate they had increased during the experiment. The UW system increased by 4.5 percent and enrollments among the 12 nonexperimental centers increased an average of 9.2 percent.

If the experimental centers drew enrollments heavily from any of the nonexperimental centers, the changes in enrollment should (1) be a greater decrease for that center than the others when the experimental tuition rates are put into effect and (2) rebound more when the experimental tuition rates are terminated. None of the enrollment patterns among the 12 nonexperimental centers, except one, met this criteria. All of the centers that experienced a less than average growth rate between 1970-72 and 1973-75 also experienced below average growth between 1973-75 and 1976-78. The exception was a center that was involved in a reorganization of its governance structure that allowed it to be more responsive than it had been to the curricular needs of its community.

Data on private sector enrollments are not as well documented as for the UW system. However, according to the Wisconsin Association of College Registrars and Admission Officers "there were no major changes in total enrollment and no change pattern which could be associated with the specific years of the low fee experiment" (University of Wisconsin System, 1981).

Other information on the entrance status of students at the experimental centers shows the percentage of change in the number of students continuing their programs, reentering, transferring and beginning. These percentages are shown in Table 14.

Table 14

PERCENTAGE CHANGE IN ENROLLMENTS
BY ENTRANCE STATUS

Entrance Status	From Preexperimental Period to Experimental Period	From Experimental Period to Postexperimental Period
Rural Experimental center		
Continuing	25% (166 to 208)	-14% (208 to 178)
Reentry	383 (6 to 29)	-45 (29 to 16)
Transfer	47 (15 to 37)	-22 (37 to 29)
New	16 (215 to 250)	-16 (250 to 209)
Suburban Experimental Center		
Continuing	57% (214 to 336)	-16% (336 to 281)
Reentry	68 (19 to 51)	-35 (51 to 33)
Transfer	82 (54 to 98)	-37 (98 to 62)
New	38 (247 to 341)	-26 (341 to 251)

NOTE: Percentages in the first column are based on an average enrollment of 402 at the rural center and 534 at the suburban center for 1970-72. Percentages in the second column are based on average enrollments of 524 and 826, respectively.

Table 14 shows two interesting results. First, the numbers of each type of student increased when the fees were reduced and they decreased when the fees were reinstated. Second, the percentage changes, both increases and subsequent decreases, in the number of reentry, transfer and new students was greater for the suburban center than the rural center. An exception was the percentage increase in the number of reentries for the rural center which was calculated on a base of six students. The greater changes for the urban center would be expected, given the

larger number of institutions presumably available from which enrollments can be drawn. While the suburban center induced a larger percentage change in transfers than the rural center, its enrollments were also more sensitive to new students than was the rural center.

The characteristics of the student bodies changed during the experiment indicating that the new, transfer or reentering students were more adult. Admittedly, a national upward trend is evident in the average age of students. However, the average for both experimental centers declined when the tuition levels were restored to comparable levels at other centers, although the average age had increased sharply when the experiment began. The average of all students attending part-time in the United States is also rising gradually. In the experimental centers the percentage attending part-time doubled when the experimental tuition was in effect, declining moderately when the experiment ended.

While too much confidence should not be placed in these figures based on two small institutions, the collective evidence is fairly conclusive regarding the positive effect on enrollments of reducing tuition. Moreover, most of the induced enrollments are probably adults who otherwise would not attend.

The results from the Wisconsin experiment yield tuition elasticities that are very similar to those given in Table 12. For the rural center, the changes represent a cost elasticity of -1.5 (assuming that the average cost of attendance was $2,225), which equals the estimate given in Table 12 for individuals

choosing between a community college and a public four-year institution. For the suburban center, with more education options available, the implied cost elasticity is -3.1, which is quite close to the -3.2 reported in Table 12 for those considering a full range of postsecondary education options.

The Importance of Distance

The convenience of community colleges to the people served has always been a topic of interest to education policy makers. By one standard, access can be evaluated in terms of physical proximity to colleges. Since nearly all community college students commute, distance to a community college represents a cost -- transportation and the foregone opportunities for the time spent commuting -- that should be included as part of the cost of attendance. (See Berne, 1977; Hoenack, 1967; and Tuckman, 1972, as examples of the use of distance to create a community college cost variable.) Distance to the nearest community college as a proxy for these costs is as important or more important than conventional student costs in influencing community college enrollment decisions (see Table C-5 in the appendix).

Regression analyses of community college attendance in this project show that distance to the community college has a significantly negative effect on the probability of attending college. For those choosing between attendance at a community college and not attending at all, an increase of five miles in the average distance to the nearest community college would result in 16 percent fewer enrollments. For those choosing between a community college and another type of institution a five mile

increase in the distance to the nearest community college would result in 13 percent of the students preferring to attend elsewhere.

The distance individuals travel to attend community colleges also provides information about the market areas served. In 1972, 73 percent of the population lived within 30 miles of an in-state community college and 81 percent of the individuals attending a community college lived within 30 miles of one (see Table 15). Sixty-four percent of those students attended the nearest community college. The converse of this issue is that 19 percent of community college students with a community college located within 30 miles and in-state chose to attend a community college located further away. These students presumably chose those community colleges because of special programs they had or because of the attractiveness of their geographical location (and some may have, in fact, attended the nearest community college but it was located in another state). Furthermore, 17 percent (81 minus 64) of the community college students with a college located within 30 miles (and in-state) chose to attend one of those community colleges, but it was not the closest one. Assumedly one main reason for these choices is the availability of particular courses. The other is that the further community college may represent the individual's district community college. Although the community college in another district may be closer, the higher out-of-district tuition may be greater than the difference in commuting costs.

Although the exact reason is not known for students choosing

Table 15

THE PROXIMITY OF INSTITUTIONS, 1972

1.	Percentage of individuals with a community college located within 30 miles and within state	73 percent
2.	Percentage of those attending a community college who attend within 30 miles and within state	81 percent
3.	Percentage of community college students who attend the nearest community college within 30 miles and within state	64 percent
4.	Percentage of individuals with some other postsecondary education institution located within 30 miles and within state	87 percent
5.	Percentage of those attending some other postsecondary education institution within 30 miles and within state	37 percent
6.	Percentage of students attending other postsecondary education institutions who attend the nearest such institution within 30 miles and within state	12 percent

Source: Calculations from ECS file using NLS, HEGIS and other data.

a more distant community college, an estimate of the greater value to the student of the selected, more distant community college can be derived from information about the distance traveled. In 1972 the average distance to the nearest community college (for those with an in-state community college located within 30 miles) was 6.1 miles. For those attending a community college that was not the nearest community college (also was within 30 miles) the distance was an average of 5.8 miles more than to the nearest college. In essence, these individuals nearly double the distance they travel and presumably their commuting costs to attend the selected college. Since the transportation cost of commuting constitutes 21 percent of the cost of attending a community college (College Board, 1981) and 30 percent of the cost of attendance if an imputed cost of commuting time is included (Hyde, 1980a), the additional value to the student of the particular program is equal to at least this proportion of what the cost of attendance might be.

While, at most, 17 percent of the community college students in this sample attend a more distant institution, among students attending other types of institutions, the percentage is 25. However, only 37 percent of the students with another type of in-state postsecondary institution located within 30 miles attend one of those institutions. Sixty-three percent attend an institution beyond 30 miles. The conclusion is that proximity is a more frequent consideration for the prospective community college student than for an individual contemplating attending some other college or university. Zemsky, et al. (1980), have

examined this same issue in terms of the importance of local, regional and national markets in higher education. Their research confirms the local nature of community college markets. The importance of distance to a community college takes on a new dimension when sparsely enrolled programs and small, rural community colleges become candidates for elimination or closure because of financial problems.

Other higher education environment variables did not appear important for influencing community college enrollment. Minority enrollment and half-time enrollment, meant to measure the orientation of colleges to nontraditional students, were not particularly important. Institution selectivity variables also were not particularly important. They were entered primarily as control variables and indicated that a high average ACT score of entering freshmen at community colleges decreases the likelihood of community college attendance, consistent with the effect of an increase in selectivity diminishing enrollment. Results of 18 higher education environment variables are explained in more detail in Appendix C. A set of variables measuring several dimensions of an individual's disposition showed no strong influence except for one's sense of community orientation, which had a positive effect on individuals choosing between attending a community college and not attending at all.

Despite the positive relationship that policy makers assert exists between the unemployment rate and community college enrollments, regression analysis did not provide unequivocal support for the existence of a strong relationship. The

unemployment rate showed a highly significant, positive influence on enrollments initially, but lost its statistical importance when the higher education environment variables were introduced. Consequently, the resulting positive, but insignificant, coefficient represents a minimum estimate of the significance of the unemployment rate to influence enrollment. The true influence of unemployment on enrollment lies somewhere between these two estimates.

In these regressions a binary dependent variable is used in ordinary least squares regression analysis. To see if the binary specification influenced the statistical results of the analysis, conditional logit analysis, which takes into account the multiple options that an individual actually faces in making a decision about attending college, was also used. Results generated for ECS under contract with University Consultants, Inc., a private research firm, yielded similar conclusions.

Comments About the Adult Student

Although much of the available data about access are drawn from "conventional" youths, much of this report is written with a more diverse, generally more adult population in mind. However, there are a few issues of access for adults that need to be discussed explicitly. Adults have quite different circumstances, and results of analyses of conventional youths should not be extrapolated to older individuals. Adults constitute a growing proportion of enrollments, especially among community colleges, and they must be given greater attention.

In 1973, about half of all students were less than 20 years

old. Five years later, less than one-third were of that age. While some of that increase in average age may have resulted from an increase in the number of graduate students, which would raise average ages, the age of students at community colleges also increased. In 1973, 44 percent of community college students were less than 20 years old; by 1978 less than 30 percent were under 20 (Hyde, 1980).

Moreover, the community college student is more adult than students attending elsewhere -- entailing greater family and employment responsibilities --

> even controlling for age. Specifically, community college students of any age have more attributes of adulthood in terms of being a head of a household, being married, being employed or being divorced than students of the same age attending a four-year college or university (see Table 16). In essence, the distinguishing feature of community college students that makes them respond differently to various public policies is not their age per se but various attributes often associated with age.

The trend of increasing adultness of students is likely to continue. The Carnegie Council (1980) predicts that in the year 2000, 52 percent of undergraduates will be women; 25 percent, minority; 45 percent, part-time; 41 percent, attendance at a two-year institution; 85 percent, not resident on campus; 50 percent over 22 years of age (p. 54).

Table 16

CHARACTERISTICS OF STUDENTS BY AGE GROUP AT PUBLIC TWO-YEAR, PUBLIC FOUR-YEAR AND PRIVATE FOUR-YEAR INSTITUTIONS, FALL 1978

Percentage of Students Who Are:	Age: 14-19 Public Two Year	Public Four Year	Private Four Year	Age: 20-25 Public Two Year	Public Four Year	Private Four Year
Head of Household	4.5	3.3	1.5	32.3	22.3	23.9
Married	2.1	1.4	0.4	25.7	15.7	12.7
Widowed/Divorced	0.3	1.6	0.0	4.3	1.6	2.1
Working	60.7	34.5	31.9	69.3	50.3	49.1

Source: William Hyde, "The Age and Related Demographic Characteristics of Students Attending Community Colleges and Four-Year Institutions." Working Paper No. 32. Denver, Colo.: Education Commission of the States, 1980.

Analysis of the determinants of adult college attendance, however, is sparse. Nearly all analyses of college-going behavior have been undertaken using samples of conventional college-aged youths. A popular and singular exception has been a study by John Bishop and Jane Van Dyk (1977) using data from the 1970 census and the 1972 current population survey. Two of their primary conclusions deserve close examination: (1) "[A]dult [defined as older] students are more responsive to tuition levels than are recent high school graduates" (p. 53) and (2) "except for lowering tuition, there is little public policy can do to further stimulate [sic] the growth of adult enrollment" (p. 57).

The conclusion of Bishop and Van Dyk that adults are more responsive to changes in tuition than conventional youths is based on tuition elasticity estimates of -0.44 for husbands and -0.58

for wives. Estimates in other studies they cite for conventional youths are lower. However, there is a fundamental difference between the two sets of estimates. Most adult students attend community colleges while conventional youths attend a full range of colleges and universities. The Bishop and Van Dyk elasticities could be viewed as elasticities of adult (older) students or of students attending community colleges who on average have more attributes of adulthood. Estimates of community college tuition elasticity presented in Table 12, based on "conventional aged" youths attending community colleges, are similar to the estimates of Bishop and Van Dyk. Consequently, the higher elasticity estimates that Bishop and Van Dyk found, relative to other studies of conventional youths, may be a function of the type of institution and the prevailing characteristics of students likely to attend that type of institution rather than the age of the student. At the very least, the distinction between adult and conventional students should rest on more than a difference in age.

The second conclusion, that there is little that public policy can do, besides lowering tuition, to stimulate further growth of enrollments, flows directly from their empirical results. However, only a limited number of variables are included, and a measure for distance to college is not well specified. An omission or misspecification of variables important in explaining the behavior under examination will effect the results and consequently possibly the conclusions drawn from those results. It was under this circumstance that they drew their

conclusion that only by lowering tuition could adult enrollments be stimulated by public policy. Even this conclusion lacks conviction. The authors themselves state that the tuition has a significant effect on enrollments only when the tuition level is below the mean. For higher tuitions, variation has no meaningful impact on enrollment (Bishop and Van Dyk, 1977, p. 47). Short of some major public initiative, they expect adult enrollment rates to slow and possibly decline.

This study contends that other institutional policies affect adult enrollments more than tuition, and they may suggest viable policy alternatives. Intuitively, the importance of tuition should be less for adults than for youths because of the former's greater incomes. Furthermore, adults who are poor but who attend college for credit often have strong motivations to gain job skills or to acquire necessary, "mandated" training for promotion for licensure (Cross, 1981). Often employers will pay some of the costs of attendance. These students see the necessity of obtaining the education and will be fairly insensitive to the tuition levels. For other adults with greater income, community college tuition does not represent a large outlay. Of greater importance to both groups of adults, who generally are employed and have families, is the time required to obtain the education and the convenience of acquiring it.

A study of the trade-offs that individuals prefer to make between the amount of tuition paid and the amount of time spent commuting to college shows that adults were more willing than youths to pay more tuition to reduce commuting (Hyde, 1980b).

Respondents were asked whether they preferred to enroll in a program that had a $100 tuition and required 40 minutes of commuting time to get to class or that had a $200 tuition and required 20 minutes commuting time. They were then asked to choose between paying $200 tuition and commuting 20 minutes and paying $100 tuition and commuting 30 minutes.

In the study the frequency of classes and duration of the program were specified so that from the pattern of responses a dollar value could be assigned to commuting costs. Three valid values were possible: (1) less than $3.13 per hour, (2) between $3.13 and $6.25, and (3) more than $6.25. A small number of respondents gave answers that implied that they simultaneously valued commuting time at less than $3.13 and at more than $6.25 per hour. It was assumed that these individuals either did not understand the question or gave erroneous answers. Assigning single point values of $3.00, $4.69 and $6.50 to the three response values, and weighting them by the percentage response for each value, produced an average imputed cost of commuting of $3.94 per hour for youths and $4.51 per hour for adults. This is a difference of about 15 percent.

Furthermore, in the analysis presented earlier of factors influencing community college attendance among conventional college aged youths, many of whom have adult responsibilities, distance also was a factor. For those choosing between attending a community college and not attending at all, distance to the nearest community college was more important than the average cost of attendance in explaining attendance (see Table C-5).

In a very limited sample of adults who had attended college for at least four years following their graduation from high school, the ECS study showed that the most important determinant of community college attendance was distance to the nearest community college. All other variables important in explaining attendance among conventional youths -- high school preparation and socioeconomic characteristics -- were of no consequence. Student costs were negatively related to attendance. The results indicated that the individuals were highly sensitive to costs, although the significance of these variables was no greater than it was for the conventional youth.

While this adult sample consisted of only 126 observations composed of individuals who were dominantly Black women below average in ability, socioeconomic status and high school preparation, the collective evidence suggests that distance, and the cost and lack of convenience it represents, is an important determinant of adult enrollment.

A Concluding Note About Access Among the States

A long standing policy question concerns the possible difference made on access by charging high or low tuition. Access in California, with its absence of tuition for its community colleges, is often pointed to as evidence of the effectiveness of not having tuition. In contrast to California, one can look at tuition levels and participation rates in states such as Pennsylvania, Minnesota or Vermont, where tuition is high and

participation is low, and draw the same conclusion about the effect of tuition on enrollment. Unexplained, however, is the phenomenon of several southern states in which tuitions are low at community colleges but community college participation rates are also low. Different factors are involved if two states that have similar tuition pricing policies have dissimilar participation rates in higher education.

Another illustration of the paradox between tuition pricing and enrollment rates is that of Texas and Pennsylvania. Texas has a large public sector (88 percent of enrollment is public), low tuition and fees in both community and state colleges and a high community college participation rate. Pennsylvania has a smaller public sector (59 percent public), high tuition and fees in both community and state colleges and a low participation rate in both community and state colleges. Yet, both states have an overall higher education participation rate of 15 or 16 percent. Of course, enrollment in private institutions is a factor that accounts for much of the apparent discrepancy. That situation in itself raises questions about the historical presence of private institutions in the states, quality differences among public and private institutions, the willingness of states to provide aid to private institutions, either directly or indirectly through student financial aid programs, and it also raises the question of what are the expectations of prospective students to pay for their education.

From the analysis presented in this chapter we know that the influences on enrollment are anything but simple. Tuition pricing

(and student financial aid) policies often reflect an attitude toward or commitment to access which is perhaps more important than tuition, by itself, in affecting enrollment. For example, we know that geographical proximity is important because it makes the educational opportunities more convenient as does flexible scheduling, off campus instruction and various student support services. Program offerings, quality of programs, ability of prospective students, the characteristics of four-year colleges and universities, and interactions among these factors all influence access within a state. Also important is the historical role of private and public institutions of higher education in a state, the public attitude toward the value of education and its contribution to the welfare of a state's population and development of the state's economy, and individual expectations regarding the costs of education.

It is the author's belief that the determinants of access are too many and often too difficult to measure to provide a tidy accounting of the relationship among states of tuition levels and enrollment.

It is, however, worthwhile identifying as best we can elements affecting access, the contributions that they make, and the costs of using various elements. A key distinction that should be made is between institutional factors and other factors in the jurisdiction of the state or federal government which influence access. Perhaps unfairly, in the past government has received more attention than institutions regarding their efforts to enhance access. However, there is much that institutions can

do to promote access as well, and while many have quietly, in a less visible way, proceeded with their strategies for promoting access, recognition of what they have or have not accomplished and of what is their potential deserves closer attention.

IV. INSTITUTIONAL PRACTICES AFFECTING ACCESS

The Importance of Institutional Elements of Access

For deliberations regarding the best way to promote access, it is important to be able to attribute to the proper entity or policy the degree of access achieved by that entity or policy. While this task is difficult, a beginning is made here by separating the importance of institutional attributes that affect access from the importance of institutional location. Institutional attributes, as discussed in the previous section, are presumably largely within the policy domain of the institution. The decision to locate an institution in a particular place may be a legislative decision. An approach that could be used to estimate the separate effects of these two factors on access is illustrated with data collected in this project from Texas on its community and state colleges. If data were available the practice could also be used with off-campus sites to evaluate the effectiveness of institutional qualities in serving its community. The purpose of the following analysis is to distinguish between the influence of geographical location of college and other institutional factors on minority enrollments.

Public policy to promote minority enrollment in higher education can occur in several ways. One approach is to locate institutions in high concentrations of minorities. State legislatures, coordinating or governing boards or institution staff themselves, in pursuit of providing educational services to minorities, may establish community colleges in urban minority

population centers. When such an institution opens its doors, it is bound to attract substantial numbers of minorities.

A second approach, and one that requires a greater effort, is to have an institution adopt policies that require it to take active steps to enroll minorities. Such measures include informing prospective students of educational opportunities, encouraging them to enroll and providing them with needed education-related services. This approach has many dimensions, but the success attributed to an institution in attracting minority students can be measured by the extent to which minorities enroll relative to their number in the area served by the institution.

A separate market area is defined for each community college by using a representative ratio, which is the percentave of students who are minority divided by the percentage of minority population served by the college. The population served by a community college is defined as the population in the smallest number of counties from which is drawn at least 75 percent of the college's in-state enrollment. The minority percentage of that population is a weighted average of the county minority percentages, weighted by the county populations. For example, Austin Community College (ACC) draws 84 percent of its in-state students from Travis County so ACC's population base for the purpose of these calculations is considered to be Travis County, which has a Black population of 11.7 percent. ACC has a 9.6 percent Black enrollment; thus the representation ratio for ACC is 0.82. This indicates that ACC enrolls Blacks less than in

proportion to their numbers in the population served by ACC.

Twenty-seven of the 60 community colleges in Texas draw at least 75 percent of their students from one county, but some have much larger market areas. For example, Blinn College draws upon 11 counties to obtain 75 percent of its students. Ranger Junior College draws upon 21 counties. Both colleges are located in rural areas approximately equal distances from several metropolitan areas. Similar calculations of representation ratios were made for 18 state colleges. The state colleges serve more of a state market. Consequently, the number of counties from which 75 percent of their students is drawn is generally larger than for the community colleges.

Table 17 shows the percentage minority enrollment, the percentage minority population and representation ratios for Blacks and Hispanics for community and state colleges in Texas. The first row gives the unweighted institutional average of the percentage of Blacks and Hispanics in the population that has been defined as the college's market area. The estimates give the same weight to market areas with small populations as to market areas with large populations. This probably corresponds with enrollment size of institution. Row 2 provides the same information as row 1 except that the reported figures are based on calculations for the institutions, which are weighted by the size of their market area population. Row 3 gives the average statewide minority percentages for the population. Row 4 gives the average percentage of students that is minority. Rows 5 and 6 give the representation ratios, using different minority populations. Row

Table 17

MINORITY POPULATION AND ENROLLMENT IN COMMUNITY AND STATE COLLEGES, TEXAS, 1979

		Black	Hispanic
(1)	Average (unweighted) percentage of college market area for		
	community colleges	12.8	15.9
	state colleges	12.8	21.4
(2)	Average (weighted) percentage of college market area for		
	community colleges	16.1	13.8
	state colleges	14.5	17.7
(3)	Average statewide percentage	13.2	18.7
(4)	Average (weighted) percentage of students minority		
	community colleges	10.2	16.6
	state colleges	6.7	17.0
(5)	Average representation ratios (based on state minority population)		
	community colleges	$\frac{10.2}{13.2} = .77$	$\frac{16.6}{18.6} = .89$
	state colleges	$\frac{6.7}{13.2} = .51$	$\frac{17.0}{18.7} = .91$
(6)	Average representation ratios (based on market area minority population)		
	community colleges	$\frac{10.2}{16.1} = .63$	$\frac{16.6}{13.8} = 1.20$
	state colleges	$\frac{6.7}{14.5} = .46$	$\frac{17.0}{17.7} = .96$

SOURCE: Calculated from unpublished enrollment and population data of the Texas College and University System Coordinating Board.

5 is based on the total state minority population; row 6 is based on minority populations of the college's market areas.

The most valuable information in the table is drawn from comparisons among data. First, comparison of rows 1 and 2 indicates that Blacks are concentrated in large college market area populations, presumably more urban areas, more than Hispanics. It appears that Blacks are concentrated near large colleges, especially community colleges, in urban areas and that Hispanics are concentrated near smaller colleges, especially state colleges, in less urban areas.

Second, comparison of rows 2 and 3 indicates that community and state colleges have market areas with larger than average concentrations of Blacks. Furthermore, the community college market areas have larger concentrations of Blacks than the state colleges. For Hispanics, the reverse is true. Hispanics are not concentrated in college market area populations, and they are more concentrated in state college market area populations than in community college market area populations.

A comparison of the representation ratios in rows 5 and 6 shows the difference that institutional location has upon the degree to which a college serves minorities. In row 5 the ratios are based upon the total state minority population; in row 6 the ratios are based upon the market area minority population. Comparison of representation ratios between rows 5 and 6 restate the conclusion drawn from comparing rows 1 and 2. Blacks are concentrated more than Hispanics in college market areas. Thus, the representation ratios for Blacks are lower when the reference

population is the college market area than when it is the entire state. The reverse is true for Hispanics.*

An attempt to separate the importance of these two factors -- college location and institutional attributes affecting serice to minorities -- is shown in Table 18. Reading down the first column, for Blacks at community colleges, one can see tnat 13.2 percent of the state's population is Black. The population of community college market areas, howver, is 16.1 percent Black. If community colleges enrolled Blacks in proportion to their number in the market area of the colleges, Blacks would be overrepresented in relation to their number in the state. Actual Black enrollments are 10.2 percent of total enrollments. Presumably, Black enrollment would be less than 10.2 percent if the colleges were located in areas with lower concentrations of Blacks.

The next row is an indicator of the influence that location of a college may have on enrollments -- the higher the concentration of Blacks in the market area, the higher the likelihood of more Black enrollments. The location of community colleges is such that the average Black population of community college market area is 2.9 percentage points higher than it is for the state. The last row shows the discrepancy between the average percentage of Blacks in the market areas and the enrollment

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*The lower ratios for Blacks than Hispanics at both types of colleges are probably due to the presence in Texas of a few all Black state colleges that were excluded from this analysis but that undoubtedly draw upon potential students of the other state and community colleges.

Table 18

THE INFLUENCE OF COLLEGE LOCATION AND INSTITUTIONAL ATTRIBUTES ON MINORITY ENROLLMENT, TEXAS, 1979

	Blacks		Hispanics	
	Community Colleges	State Colleges	Community Colleges	State Colleges
Percentage of population that is minority				
For the state	13.2	13.2	18.7	18.7
For the average college market area (weighted)	16.1	14.5	13.8	17.7
Average percentage of college enrollment that is minority (weighted)	10.2	6.7	16.6	17.0
Possible influence of college location (market area minus state)	+ 2.9	+ 1.3	- 4.9	- 1.0
Possible influence of institutional attributes (enrollment minus market area)	- 5.9	- 7.8	+ 2.8	- 0.7

SOURCE: Calculated from unpublished enrollment and population data of the Texas College and University System Coordinating Board.

percentages of Blacks in community colleges. Undoubtedly for many reasons, community colleges do not enroll Blacks in proportion to their number in the colleges' market areas. However, the less than proportional enrollment of Blacks, relative to their number in the state, is partially alleviated by the advantage gained by locating the colleges among concentrations of Blacks.

Similar information is presented in Table 18 for Blacks at state colleges and for Hispanics at both community and state colleges. A comparison of Blacks at community and state colleges shows that the potential influence of location is twice as great for community colleges as for state colleges. The institutional influence results in less underrepresentation of Blacks at community colleges than at state colleges.

For Hispanic enrollment, the location of both community and state colleges is a disadvantage -- the percentage of a college's market area population that is Hispanic is less than for the state as a whole. Nevertheless both state and community colleges, especially community colleges, do fairly well in enrolling Hispanics. Community colleges do better than state colleges in enrolling Hispanics from their respective market areas, but the overall effect of location and other institutional attributes that appeal to prospective students produces similar results. The Hispanic representation ratios are .9 for both types of college and higher when the ratios are based on market area populations (see Table 17).

The overall outcome is that minorities in Texas are served slightly better by community colleges than by state colleges. For

Hispanics, the largest minority group in Texas, there is little difference in the degree to which they are represented. Blacks, among multiracial colleges, are better represented in community colleges than in state colleges.

The source of these results lies in the degree to which colleges are located in areas with concentrations of minorities and in the degree to which institutional behavior (recruitment, curriculum and reputation) encourages enrollments. Analysis shows that these two factors are of varying importance to state and community colleges depending upon the minority group considered. Nevertheless, this method of examining the open access issue of colleges forces one to think of different standards that may be appropriate in judging the success of a state and institutions in achieving open access and promoting greater access. Public policy efforts to improve access or to maintain it at minimal expense requires knowledge of the extent to which different factors are responsible for the progress achieved.

Institutional Elements of Access

Educators have expressed much concern about the role of state and federal policies affecting access and about the potential impact of cutbacks. While these changes will undoubtedly have negative consequences for community colleges, the anticipated impact may be overstated for community colleges. First, the largest cutbacks in student financial aid programs will probably be in loan programs. Because community college students do not make use of loans as extensively as other students, they have less

to lose. Cutbacks in student financial aid programs may result in increased community college enrollments as students no longer able to afford attendance at four-year colleges and universities attend community colleges instead. Second, a host of institutional practices, entirely within the domain of the institution, may be more important than state or federal government financial policies in influencing access.

Although institutional practices that promote access are difficult to quantify, documentation suggests that the range of practices is extensive and not necessarily costly. To develop a list of institutional elements of access, the author selected a community college with a national reputation for serving its community -- the Coast Community College District (CCCD).

The Coast Community College District, located about 30 miles south of Los Angeles, has three community colleges: Coastline Community College, Golden West College and Orange Coast College. The three colleges enrolled over 72,000 students in credit programs in the fall of 1980. The district has the highest per capita participation rate in the United States. Over 40 percent of its 600,000 population participate in one form or another of the district's community college activities.

Staff at the three colleges and the district office were interviewed to obtain information about their institutional practices that promote access and were questioned about the prerequisites that were responsible for fostering access. The elements of access are grouped into three main categories: (1) diversity of program offerings, (2) public relations and (3)

student support services. Each is discussed briefly.

Diversity of Program Offerings

Because people have a wide range of education interests, the scope of programs and activities offered by a college will certainly affect the number of individuals who want to enroll. CCCD offers probably as large a variety of subjects as any community college. However, the effect that diversity of offerings has upon enrollments depends largely upon when, where and how the programs are offered. It is these attributes of the district's offerings that deserve elaboration.

The provision of convenient instruction has always been a central tenet of CCCD's staff. When the district decided to establish Coastline Community College, the third college in the district, the Board of Trustees, acting on the recommendation of Chancellor Norman Watson, approved a plan that made Coastline a college without a campus. All instruction was to be provided through community facilities or home study. Under the direction of President Bernard Luskin, Coastline began operation in 1976. In the academic year 1979-80, it enrolled 57,325 students.

Luskin is convinced that much of the success is due to the convenience and proximity of the activities to the students. Although the district is only 105 square miles in size, Coastline has over 150 instruction sites throughout the district. Courses are offered at all times of day; course completion time ranges from a few weeks for minicourses to regular semester length. To achieve further flexibility Coastline has a division of independent study whereby students study at home, often assisted

with audio visual aids, and have frequent interaction with the course instructor by telephone.

The district also operates the public broadcasting television station for the region. A number of courses are broadcast on this station. Over the years, the district has designed and produced 20 courses and has distributed them nationally. The telecourses provide an alternate learning opportunity for many individuals.

Another attribute of the district that promotes access is recognition that different students may perform better with different methods of instruction. The staff do not view the provision of television courses as competition for conventional classroom instruction but only as another option a prospective student may choose. Similarly, campus classroom instruction is also varied. For example, the natural science courses use a mixture of lecture and videodisc instruction. Other curricula, such as the secretarial program, rely heavily on self-paced instruction, although the secretarial curriculum may be modified to provide more direction for students who need a more supervised program. The underlying wisdom of the staff is their realization that people have different learning styles and that accessibility -- in terms of subjects, location and means of instruction -- is important to students.

Public Relations

If members of a community are to participate in the activities of a community college, a prerequisite is their knowledge of available opportunities. Such public awareness is one of the priorities of the district's administration. To this

end, CCCD undertakes a host of activities designed to inform the public. A few are listed below.

1. Each semester the colleges mail schedules of classes to all homes in the district.
2. CCCD works with businesses to give joint visibility to the firm and the district. For example, banks in the community agreed to mail along with their periodic customer account statements an enclosure prepared by the district giving information on a personal finance course in which they might be interested.
3. When a new course or curriculum is developed, the district seeks news coverage by holding a news conference and having available at the conference course enrollment forms.
4. The district advertises in local newspapers for students to fill classes that are slightly underenrolled.
5. In a national magazine, published annually for high school seniors, CCCD has a pull out section about the district in the regional edition.
6. The district is an annual sponsor of the community's high school yearbooks.
7. CCCD seeks to have public affairs and current events take place on campus or with their facilities. Community service activities are a large but self-supporting enterprise that provide visibility for the district.

Student Support Services

The third category of institutional factors promoting access is student support services. In many colleges, student financial aid is the most prominent support service. At CCCD, most students are drawn from a broad middle class and do not need financial assistance. Few of the population have low incomes with the exception of a Vietnamese contingent that constitutes about 15 percent of the student population. Much is done to assist the Vietnamese students. They receive 90 percent of the student

financial aid allocated through campus-based aid programs. The financial aid office at one of the colleges employs a Vietnamese in its office to teach fellow Vietnamese how to comply with the system.

Day care is another support service very important for some students. The colleges operate day care centers that are tied into regular college curricula, providing a lab school setting similar to that of many research universities. With a 75 cents per hour fee, the centers are financially self-supporting, although the cost of staff time is allocated to the academic department rather than to the center.

A number of community services might also be considered support services. For example, one of the colleges established a women's center that has a strong orientation to the community but also serves many students. In fact, a number of the women decided to enroll in college after participating in the center's program. Commuity college staff in all colleges generally believe that community service activities have two important side effects for the college: they provide visibility and publicity and they stimulate further interest in the college. Although quantification of the value of these benefits to a college is not possible, staff at the CCCD view it as an important element of their success. While other perhaps unique reasons might be given for CCCD's exceptional success, CCCD receives no more funds per student than any other California community college. While its size, and that of perhaps four or five other community college districts in California, provides some economies of scale, that

advantage is probably not a major one.

Most of the institutional elements of access require more hard work than money. In addition, other nonfinancial considerations are important. Chancellor Watson, who has been with the district for 30 years, believes that a primary requirement is having a Board of Trustees that provides a healthy climate for operation of the district. It allows staff a high degree of autonomy and is supportive of the staff's innovative efforts, even though all may not all be successful. Another key ingredient is establishing personal contact with the residents of the community. Board members, staff and faculty are involved in local civic affairs; citizen advisory groups are formed for each college and the television station and for each occupational program; extensive community services involve thousands of residents. The community feels that the district colleges are its colleges.

The conclusion drawn from this assessment is that an institution can do many things to promote access. Furthermore, these measures do not necessarily require extraordinary increases in funding. Given the public financing prospects for at least the next few years, the experience at CCCD is encouraging.

V. ACCESS IN THE 1980s

Estimates exist showing the number of additional postsecondary education students that could attend if various assumptions were accepted regarding eligible students (Doermann, 1978 and Froomkin, 1970). The process usually involves some form of "leveling up" to an easily recognized value such as the average or the top quartile. These values, however, are not universally accepted. Furthermore, these judgments are made with the conventional college aged population. The increase in adult students presents a different context and raises a number of issues about subsidizing education programs for them. One way of examining this issue is from an economic perspective. The purpose of the first part of this chapter is to identify issues of financing adult access and to examine its relation to conventional access within an economic context.

The second part of the chapter deals with more pragmatic considerations. While policy makers and educators will occasionally express explicit value judgments about the amount of access needed, more frequently the desired amount of access is given in terms of people's actions. Answers can be found in the priorities of policy makers. As new issues emerge, old ones become less important. In higher education a shift is occurring from an emphasis on the individual student by federal and state governments to a concern with institutional issues of quality and budgetary constraints. The implication is clear. If actions and the allocation of resources mean anything, access is not receiving its former attention. The challenge is to strike a balance among

various goals, as many policy makers are concerned with what may happen to access. The second part of this chapter examines some of the changing priorities, practices and trade-offs in states that are affecting access.

Financing Adult Access: An Economic Perspective

Support of education is often justified by the benefits that society and individuals presumably derive from education. Increased economic productivity, social mobility and enhanced sense of one's self are all reasons given for supporting education. However, these reasons alone are not sufficient. Several economic criteria should be met to justify public subsidy of education: (1) an individual's education should result in societal benefits, (2) those benefits should be benefits that society would not receive if it did not provide the subsidy and (3) the value to society of expenditures for that subsidy should be greater than the value to society of expending the funds for other purposes.

Unfortunately, the ability to document the magnitude of these effects is meager. A great deal of disagreement surrounds the nature of the societal benefits of education. A list of some of the more ambiguous externalities includes: (1) changes in attitudes and values, (2) increased participation in public affairs, (3) lower crime, (4) improved economic conditions and (5) increased social equity or mobility. Researchers have contended that these externalities exist and constitute a legitimate reason for subsidizing higher education (Bowen, 1977). Others have

argued that the externalities do not exist or, if they exist, do not warrant subsidy (Windham, 1980). For example, it might be argued that education reduces unemployment and crime. Others would argue that the education of one person may lead to his or her employment but at the cost of displacing another worker. The latter view contends that education does not reduce crime but only shifts its nature from violent crime to nonviolent white-collar crime, which is more costly.

Less is known about the degree to which various benefits would be realized without the subsidy. Analysis in Chapter III showed that the cost is high for inducing additional enrollments in higher education. The added value society receives from those additional enrollments is speculative. Finally, it is very difficult to assess whether those benefits exceed benefits that might accrue to society if the funds were spent on other investments. As Breneman and Nelson (1981) point out:

> There are no empirical tests for determining whether a smoothly operating private market would fail to induce enough enrollment in higher education generally or in community colleges in particular. To a large extent, public benefits are in the eye of the beholder. More or less persuasive arguments can be made for the social good derived from courses in Shakespeare or mechanical drawing or English as a second language, but the ultimate evaluation is political (p. 47).

Conventional economic considerations can be useful guidelines for allocation decisions. However, the level of support that is accepted for promoting access should be based on the full range of economic benefits, including many nonmonetary considerations. The discomforting asspect about this approach is that no easy criterion or calculus, in the generic sense, exists to

predetermine the optimal level of subsidy. The level of subsidy must and should be forged through a repeated political process where each person (1) is pleased more or less with the courses and programs offered by public colleges and is pleased more or less with the choices that individual students make and (2) gains more or less personal welfare by supporting those options and choices.

The present danger for access and community colleges is that the liberal, altruistic wave that supported the proliferation of colleges and special programs to assist disadvantaged individuals during the 1960s and 1970s is receding (Finn, 1981). If the level of support for access rides on the tide of popular consensus, a more conservative climate does not bode well for maintaining the current level of access.

Justification of public financing of adult or continuing education, particularly prevalent among community colleges, should meet the same tests required of conventional higher education for youths. Only the context changes because the underlying allocation issues are the same.

The same criterion of marginal societal benefits that is applied to conventional education should also be applied to adult education. Following is a list of a few popular adult education programs for each of which policy makers must decide what level of public subsidy, if any, to provide.

Remediation. As with remedial education in the conventional sector, a strong moral and economic argument exists for providing individuals with basic skills. There is little justification for age being a factor.

Vocational education. Vocational education, whether for entry level jobs or skills upgrading, is increasingly viewed as beneficial to the economic development of a community, region or state and on that basis warrants support. The key questions raised for subsidizing this type of education is determining how large the subsidy should be and the means to be used for allocating whatever funds are provided for achievement of this goal.

In conventional education uncertainty occurs regarding the comparability of programs and costs among colleges and universities. In adult education, vocational programs are provided by high schools, colleges, proprietary institutions, private businesses and industries and by nonprofit organizations. This much broader array of education providers encompasses a wider variety of education programs and has a wider diversity of costs.

At issue is the relationship government should try to establish between the public subsidy and the cost of the program. In the funding of colleges and universities, a frequent practice is for the state to fund a certain percentage of the total cost of the program. Should other providers be allowed the same subsidy? In business and industry, education costs may not be easily separated from other costs of the firm. In an apprenticeship program, how education costs should be calculated and which costs should be eligible for subsidy are considerations. If an educational program is offered on television teleconferencing the fixed costs of transmission and program development charged to a student must be determined.

Employer-sponsored training that is useful only for employees working in that firm would not seem to warrant public subsidy. However, the situation may be different if the firm had decided to locate where it did because of favorable state tax laws that encouraged firms to support training programs. Without the favorable tax laws the firm may have located elsewhere, depriving the state of a certain amount of economic development. In this context, public subsidy may well be justified.

Continuing occupational education. A growing number of professions and occupations have state laws or association provisions requiring periodic education throughout one's career to stay abreast of new developments in the field. While it is important to society to have qualified practitioners, whatever the trade or profession, presumably these individuals are willing to pay the cost themselves.

Bilingual education. Two issues are involved. One has to do with those for whom English is a second language and the other has to do with those for whom some other language is a second language. The former situation is viewed in much the same way as remedial education. Society owes aliens and lingual minorities an opportunity to learn to communicate satisfactorily in English. Achievement of this goal is important for acculturation and for individual, independent satisfactory performance in society.

The other side of the issue is ambiguous. Foreign language training may allow the government to serve better lingual minorities, but the size of the benefit is uncertain and might be nearly attained without subsidy, although there is a recent

increased concern for the United States to have experts with lingual competence for foreign affairs.

High technology/communication. Technology is continually changing, and individuals are perpetually adjusting to those changes. However, an equity concern in employment that is tied to the issue of adaptability is the reluctance of women to take mathematics and science programs and to enter occupations drawing upon these disciplines. The use of computers is another area of training and employment that women often avoid. The avoidance may be due to cultural or psychological apprehension women have toward occupations in which computers are frequently used. Government might take steps to reduce the sex stereotyping of occupations.

For any of these programs the assessment of the appropriateness of public subsidy for adult education is compounded by the fact that the financial perspective for adult education differs from that for convential education. Conventional college going youths attend college upon graduation from high school. Consequently, they are generally about 18 years old. At this point they have all of their adult employment years ahead of them. There is little variation in their current income and assests. Both of these conditions vary substantially for adults, making it more difficult to evaluate the appropriateness of government subsidy.

A central question in evaluating the amount of public subsidy to provide for the attainment of education is the flow of benefits society can expect to derive from the provision of that education. For monetary benefits, such as tax revenues resulting from increased employment income attributable to education, the number

of years of expected employment is important. On average, any adult will have fewer years than a conventional college aged youth to provide society a return on the education subsidy.

Obviously, monetary considerations are not the only reason for providing education subsidies. All share in the delight, for example, of the 80-year-old great-grandmother who graduates from college. Nevertheless, the package of benefits, monetary as well as nonmonetary, diminishes with age. Because adults interested in obtaining education are of varying ages, there is no single determination of an education subsidy that fits all adults as well as a single standard might apply to conventional college aged youths.

A second problem arises whenever the portion of education costs charged the student is adjusted for his or her ability to pay. Because society has placed great emphasis on providing equal educational opportunity, much has been done to reduce financial barriers to attendance. However, even among the relatively homogeneous conventional college-going youths, agreement is lacking on how income and wealth are related to ability to pay for education. Among adult students the issue is more complicated. Through an individual's life cycle there is a profile of income and a profile of wealth, but little data are available on which to base expected contribution schedules for adult students.

Access and Changing Priorities Among the States

Priorities of education policy makers are revealed by what they do not say as well as by what they do say. Governor Graham

has publically stated that access has been achieved and that education quality is now the issue in Florida. Secretary Bell, speaking at the annual meeting of the Education Commission of the States (ECS), mentioned a list of problems facing U.S. education: (1) the need for citizenship education, (2) the incompetence of college graduates in languages other than English, (3) the high unemployment and the need for vocational job training, (4) the decline in literacy and the need for minimal competency and (5) the need to improve teaching. All of these activities have to do with quality and competence. Not one word was mentioned of access, choice or educational opportunity.

For several years ECS has surveyed its constituency -- composed of governors, state legislators, chief state school officers, state higher education executive officers and concerned lay persons in the states -- regarding the key education issues. While education finance as a broad topic has remained one of the most important issues, the elements of concern within education finance have changed. Access and choice and student financial aid, which were popular several years ago, are no longer evident. The issues in education finance now have to do with budgeting and appropriations, tax and spending limitations and financing handicapped students (ECS, 1980).

The evidence is persuasive. In a world of limited resources, choices must be made, one of which appears to be for quality instead of access. While all of the access gained over the last three decades is not likely to be lost, some loss may occur and future gains may be sporadic. However, because of the many

assistance, they can review their policies to insure that what resources are available will be spent on top priorities. A few examples are provided.

In New York, a state that traditionally has been a leader in providing financial aid to its students, an access issue is whether to improve the existing full-time state tuition assistance program or to extend program eligibility to part-time students. Not unexpectedly, the Board of Regents and the independent sector favor enriching the present program. City University of New York (CUNY), with many part-time students, prefers expanding eligibility to part-time students (Van de Water, 1981).

In Florida, as in many other states, the trade-off may be between quality and access. If appropriations do not keep up with inflation, costs must be reduced. One way is to limit enrollments, which is done by imposing or raising admission or retention standards. The impact falls most heavily upon nontraditional and disadvantaged students. Miami-Dade Community College, the largest community college, has imposed minimum standards for student retention. Florida is also trying to improve the quality of education through a legislatively mandated study to define, evaluate and fund quality education. Quality and access, in many ways, are divergent forces. It will be interesting to see what balance is struck between access and quality.

California faces a different trade-off. The objectives of the community college system as defined in 1978 by the California Community and Junior College Association are (1) local control,

(2) no tuition, (3) comprehensive programs and (4) access. The policies of no tuition and open access represent what California has advocated for years; the state will be reluctant to allow erosion of those principles. The main, long term effect of Proposition 13 appears to be that local control and comprehensiveness will be sacrificed, for the time being, to maintain open door access and no tuition (Shenk, 1981).

The actions of other states may involve less obvious trade-offs but ones that have just as serious implications for access and nontraditional students. An example may be drawn from Colorado. In Colorado estimates of the coming year's enrollment levels are made and used by the legislature for funding purposes. If actual enrollments exceed projections, an additional state appropriation may or may not be made. Thus, a community college that expects to exceed the state's enrollment projection has diminished incentive to recruit students through outreach activities when it can achieve its limit by simply admitting those who apply on their own. Any emphasis by an institution to serve a particular group of disadvantaged students often falls upon the conscience of the institution's administrators. If enthusiasm is lacking or the financial constraints are too severe, outreach programs and other programs designed to recruit and aid nontraditional and disadvantaged students will be among the services that receive less attention and less funding (Hyde, 1981).

The Community College of Denver (CCD) is an example of a community college that is making a strong commitment to outreach

activities despite what it considers to be a lack of recognition of those costs in the allocation mechanism. CCD has proposed establishing a series of satellite centers located in ethnic communities that would provide information about education programs and provide support services for students. While these activities require extraordinary efforts by institution staff, CCD has consciously decided to place a high priority on serving these students.

Each state faces its own set of trade-offs, and the best that can be hoped for is that choices are made with a full understanding of what options are foregone. There is no guarantee everyone will agree that the option chosen is the best one, but it will, hopefully, provide informed decision making.

Tuition Pricing Policies

One of the main strategies for promoting access is tuition pricing. Community colleges are well known for their advancement of access through their advocation of low tuition rates. In a survey conducted by ECS of state directors of community and junior colleges in the spring of 1980, one of the questions tried to document the uniqueness of tuition-pricing policies for community colleges. The survey asked about the relationship, if any, between community colleges and other public institutions of higher education in setting community college tuition and fees. Twelve of the 34 states responding replied that the tuition and fee levels at other institutions are explicitly taken into consideration in setting the tuition and fee levels at community

colleges. Several of these (for example, Iowa, Texas Utah, Virginia, Washington and Wisconsin technical institutes) deliberately set community college tuitions below that of other state institutions, often giving the rationale that community college tuition should be lower to promote access. A few of these states (Texas, Virginia and Washington) use a percentage of cost as the basis for charging students and set the percentage lower for community colleges than for other institutions. (See Western Interstate Commission for Higher Education (WICHE), 1980, for a study of tuition setting policies in western states.)

In several states, the difference in tuition among sectors has become a concern of student equity or fiscal spending. In Colorado tuition was less at community colleges (at one time 20 percent of cost) than other public institutions (25 percent of cost), but the gap has been closed. Since 1980-81, the state community college system charges the student 25 percent of the educational cost as it currently does the student attending its public four-year institutions. Although New Hampshire, New Mexico and North Carolina stated that they do not explicitly consider the relative tuition levels in setting community college tuition levels, New Mexico and North Carolina indicated that they might begin to. Presumably this results in a smaller difference in tuition levels. In New Hampshire the general position of the governor and legislature has been to keep community college tuition below that of public four-year institutions, but recently the gap has been reduced.

Tuition pricing policies could also come under pressure as

the composition of enrollments changes. Even if enrollments do not increase and inflation were eliminated, costs at many community colleges are increasing because (1) more students are preferring vocational and technical programs or requiring developmental and remedial programs, which are more expensive than academic and general programs and (2) many of the growing number of nontraditional students require costly support services (Hyde, 1981). Conceivably states faced with rising costs because of these shifts in enrollments may make changes. They might consider extending differential tuition and fee charges now used for different levels of instruction and residence to specific courses and programs, but it appears that states are reluctant to do this.

Few differences exist among tuition and fee policies for different types of courses or for courses that have different costs. Among states responding, no state charges different tuitions based solely on varying costs of courses, although some allow institutions to assess additional fees for higher cost courses. Arizona allows locally determined graduated lab fees, and Mississippi allows special student fees for vocational and technical courses requiring costly supply items.

The distinctions in tuition and fee policies mentioned are generally in regard to the different treatment of noncredit courses. Twenty-one states indicated that they treat noncredit courses differently, generally requiring them to be "self-supporting." Here, student charges cover instructional or direct operating costs, leaving the specific assessment to the institution. However, noncredit courses constitute different

types of programs among the states, and the charge schedules are quite different. For example, in Arkansas, the only noncredit courses are community service courses. California community colleges may charge fees for recreational and cultural noncredit courses, but no state apportionment can be claimed for any course if fees are charged. Maryland has a lower assessment for noncredit courses and uses a contact hour basis. North Carolina sets the noncredit charge at $3 for extension courses while the regular full-time curriculum tuition is $49 per quarter.

In Texas, charging tuition is linked to the granting of credit. Local college governing boards have had the prerogative of offering noncredit courses without tuition. There now is a question of whether the colleges can earn contact hour funding for noncredit courses since law requires and the State Auditor uses the collection of appropriate tuition as one measure in the validation of contact hours to be counted for funding purposes.

Almost no tuition and fee distinctions exist for remedial courses. California prohibits fees for remedial courses; Illinois calculates separately the charge for certain remedial courses, and Illinois and Iowa do not charge tuition for adult education that receives state or federal reimbursement.

The concept of access was developed with conventional college-aged youths in mind and subsequently has been expanded to include adults of all ages. However, that application of the access concept to older students loses something in translation. States are not sure that the responsibility they accept toward their youths is accepted equally for all adults. State

legislatures are more receptive of education programs aimed at serving specific groups of adults such as senior citizens or those needing career retraining; they are less willing to give unquestioned support to generic lifelong learning.

In a recent survey of state educators and state legislators about the priority that lifelong learning had for them, legislators consistently rated it lower than educators (Martorana, 1980). Two plausible explanations could account for the different ratings. One is that legislators do not fully understand the significance of lifelong learning activities, in which case educators need to spend more time with their legislators informing them about lifelong learning. The other possibility is that legislators do understand and that the gap in perception of the importance of lifelong learning reflects a difference in values. The special treatment in education of senior citizens stems not so much from a concern with lifelong learning as from the sympathetic stance that society is taking toward its older citizens in many areas.

Through the ECS survey, 14 states responded that they have special tuition policies for senior citizens, although a number of other states may have institutions that provide special tuition and fee policies for senior citizens. Mississippi, for example, has no state-level tuition policy for any age category, although some local boards provide courses free to senior citizens. Some states (Arizona, Ohio and Vermont) reduce tuition for older adults, and others (Arkansas, South Carolina, Virginia and Washington) provide free tuition on a space-available basis. The

balance of states offering special policies for age groups (Connecticut, Delaware, Georgia, Massachusetts, New Hampshire and North Carolina) offer courses free to senior citizens. An additional four states (Colorado, Maryland, Missouri and Vermont) indicated that their community colleges could waive or reduce tuition for senior citizens.

In sum, many state policy makers see the issue of access as one that has been solved or one that has been replaced by higher priority issues. While there is some truth in holding such a view, there are two perspectives that are important in considering public policies for access. One is that it is important to realize that the nature of the access issue has changed. The issue of access now encompasses adults as well as conventional college-aged youths. While the same criteria ought to be applied to a decision to provide education subsidies to adults as to youths, measurement of those criteria are more difficult. The other perspective is that many policy makers view access as an issue that must be used as a trade-off to obtain other education objectives. The supposition of the zero-sum nature of access policy, however, may not be correct.

VI. SUMMARY OBSERVATIONS

Below is a list of observations that spans the breadth of the project. The observations are drawn from this report plus others written as part of this project. The other reports are listed on the last page of this report.

The items in the list are grouped by subjects. The next chapter discusses the main policy implications of the study regarding what state policy makers might do to foster access given today's circumstances.

The Facets of Access

- Provision of equal access is a concept difficult to define in measurable terms. Different standards of equal access have been used, but each has its flaws. Common measures include participation rates and net prices and student costs. A more sophisticated measure involves identifying education aspirations and expectations and attainments.
- The choice of any standard contains inherent value judgments about the expected role of public policies to alter individual enrollment behavior. Consequently, discussions of access often seem rhetorical, due to underlying different and often unstated assumptions regarding the proper role of public policy.
- An ideal standard of equal access should include (1) removal of unequal barriers to attendance, whether geographical, financial or informational; (2) an institutionally supportive climate for students; and (3)

recognition that institutional sectors operate and are financed differently.

Minority Participation in Higher Education

- Minority groups do not participate in higher education to the same extent that majority members do.
- Interest in participating in higher education and participation in higher education of minorities have risen dramatically over the last 30 years.
- Community colleges serve minorities more extensively than other institutional sectors of higher education.
- Black students are more fully integrated into the entire higher education system than other minority groups. Looking across the 50 states, one sees that Blacks participate in community colleges and state colleges to about the same extent that Whites do.
- Hipanic and Native American students are least integrated into the higher education system. More than half of all of these students attend community colleges.
- Variation in participation rates among states is high, reflecting a host of factors: the history of community colleges in the state, the mission of community colleges in the state and racial segregation in certain higher education institutions.
- State participation rates also vary by sex, probably due to the mission and curricula of colleges, traditional attitudes about community colleges and sex stereotyping or

certain occupations for which community colleges provide training.

- Community colleges in less populated states serve their Black populations better than their state colleges do, relative to how well the same institutions serve Blacks in more populated states.

Student Costs

- Community college tuition levels may increase at a faster rate than tuition levels at other types of institutions. Community college tuition as a percentage of average institutional costs has been less than for state colleges. Efforts to achieve parity in tuition pricing by charging the student the same percentage of cost will result in tuitions rising more rapidly for community colleges than for state colleges.
- For low-income students, the difference in cost of attendance between a community college and a state college in 1978-79 was less than $100.
- For low-income financial aid recipients, average net price at a public two-year college in 1978-79 was $1,200. At a public four-year college the net price was $700.
- Community college tuition and fee charges among the states ranged in 1978-79 from almost nothing to neary $800. The average was $384, $225 less than for state colleges.
- Eight states had a tuition and fee difference between community and state colleges of less than $100.
- The relative importance of the difference in tuition and fees between community and state colleges can be observed

when the student's full cost of attendance is considered. Tuition and fees constitute on average between 20 and 25 percent of the cost of attendance at a community college and less than 20 percent at a state college.

- Transportation costs constitute about the same percentage of the budget as tuition and fees. If the value of the student's commuting time is included in the costs, transportation costs on average exceed tuition and fee costs for the more than 95 percent of community college students who commute.
- Calculated student costs often hide other cost considerations that may be more important in an individual's decision to attend college or in choice of college than the relatively small dollar difference that may exist between measured costs at a community and state college. Foregone earnings, commuting time, marginal student costs and the value of the education experience are four factors that can bias the outcome one might expect by viewing only direct, monetary student costs of attendance that institutions use in making calculations of student financial aid.

Institutional Budget Considerations

- Many college administrators believe that they could be more successful in fulfilling the missions of their institutions if state budgetary constraints were relaxed. They think that if resources are to be reduced more

flexibility should be granted in how those resources are used.

- State funding formulas may be designed primarily for four-year institution curricula, facilities and student needs and interests but used for funding community colleges which may have different cost structures not appropriately reflected in the formulas.
- The open access philosophy of community colleges is in direct contradiction with the financing principle used to fund many communinity colleges. Limitation of state funding of community college enrollments to a specified maximum runs counter to the open access mission of the colleges. The practice also results in the college enrolling less frequently those who are most disadvantaged.

Community College Enrollment Behavior

- Many individual, institutional and external factors affect the degree of access achieved. Some are within the control of the higher education system; others are education variables beyond the arena of higher education, and some are nonpolicy variables. Often important factors are difficult to measure, because of data constraints or technical limitations of estimation procedures. Consequently, conclusions generally are drawn from a preponderance of evidence rather than from a single source.

- For many community college students and prospective community college students, convenience of educational opportunities appears to be the most important determinant of attendance.
- Convenience, in the form of where, when and how programs are offered, is particularly important for individuals with adult responsibilities.
- It appears that a one percent change in community college student costs will result in a two to three percent change in community college enrollments, if other factors are unchanged.
- Most of the enrollment substitution that might occur if community college costs were raised would be between community colleges and public four-year colleges.
- Enrollment demand for community colleges may increase over the next few years due to three factors: (1) a trend toward more adult students, most of whom enroll in community colleges, (2) the positive influence on community college enrollments of the economic recession and (3) cutbacks in student financial aid, which may force many students to attend a community college rather than a four-year college or university.
- Socioeconomic status, an important determinant of college choice, has no particular effect on access -- for the individual deciding between attending a community college and not attenting college at all.
- High school preparation is an important factor influencing college attendance. More public policies might be

directed at disadvantaged high school students. The benefit would be a higher quality education experience plus an increased probability of college attendance.

- Policies affecting access have been given the most attention when they are state or federal initiatives. The ability of an institution to also influence access through its own actions has probably been underestimated.

VII. CONCLUSIONS AND POLICY IMPLICATIONS

An assessment of access in postsecondary education creates an inevitable ambiguity, since individuals have different values and different expectations. Advocates and opponents of access equally can find elements that support their positions. Some may point to the change in participation rates that has occurred and conclude that efforts to improve access have been successful. Others may view the same situation and be disappointed that inequities still exist. This report has not chosen to look for consensus of values but has examined access and delineated personal values often inherently contained within certain discussions of the objective elements of access. The discussion to this point has attempted to explain the ambiguity of the definition and the measurement and achievement of access as well as the elements responsible for the achievement of access. The purpose of this chapter is to propose alternative strategies for fostering access in today's context and in a time when state policy makers are trying to do more with less.

The Changing Context of Access

In the initial years of promoting postsecondary access through public policy, state, federal and local governments supported the establishment of hundreds of community colleges and provided billions of dollars of aid to subsidize the cost of higher education. The programs, originally designed to help the low-income, needy student, expanded to help middle-income students with financial need as well. Millions of high school graduates

benefitted from the access, financial assistance or tax relief that government programs provided.

As the segment of the population aided by these programs expanded, two lines of criticism developed. One line of criticism is that there is a growing gap between the haves and the have nots. It is argued that for those students already receiving aid the issue of increasing their awards to counter inflation or to reduce their financial burden is secondary to the issue of helping disadvantaged nonstudents become eligible for college and financial aid.

Thousands of high school students with college aptitude drop out of high school often lacking adequate academic preparation and without knowing much about the career and education options that are or could be available. While it is not imperative that all of these youngsters go to college, it is important that policy makers and education administrators make considerable effort to insure that these youths are not making inappropriate decisions out of ignorance.

The second line of criticism is perhaps due to the response to access policies as well as to changes in lifestyles and practices of mixing work and learning, that have generated adult enrollments. Education policy makers and administrators have expressed a concern that adult students do not have the same education needs as conventional youths and do not respond to public policies in the same way. While these allegations appear to be justified, evidence has been forthcoming only recently.

Although increasing age of students is often the factor that

education administrators point to as an indication of the more adult student body they serve, age itself has little affect on the needs of individuals. More important are the attributes that are frequently associated with older individuals, such as responsibilities of family and employment. Shouldering these responsibilities makes a person an adult. Evidence now shows that community college students of any age are more adult than students of the same age attending elsewhere. Consequently, the responsibilities of community college students are such that their education needs are distinct from the more conventional college student.

Established government assistance programs have served well the conventional college-aged youth. Efforts to serve adults and disadvantaged youths with similar programs will be less successful. Public policies to assist well members of these two groups require different strategies. They require state policy makers to view education and to view their own role in fostering education differently than many of them have in the past.

Prospective Strategies

For the adult student, the direct monetary student costs of attendance are not as severe a barrier as for other students. However, availability of time, a factor not particularly important to the conventional college youth, is critical to the adult student. For the adult student, time for education must be fit in with several other high priorities. Indirect costs including foregone earnings are a serious consideration. Efforts to reduce

these costs by reducing time spent commuting or by offering educational opportunities at more convenient times or by other strategies to make the educational opportunities more convenient will be more useful for adults. In short, the where, when and how of education programs are key factors for the adult.

For conventional college youths, direct, monetary education costs are often a barrier to attendance. Student financial aid programs were designed with these types of individuals in mind, and the programs are successful in serving most of them. However, for a group of particularly disadvantaged youths, who often never finish high school, additional assistance prior to college enrollment is required. An issue affecting conventional youths is whether more resources should be put into student financial aid and institutional subsidies or into preparation at the high school level. If SES is so important, more attention might be given to earlier periods of development. Choice of a proper strategy rests on two factors: (1) the size of the target group and (2) the cost-effectiveness of the method.

First, while there is much talk about the equity of the distribution of student financial aid among students, many educators will point to the greater inequity between student and nonstudent. Many individuals who drop out of high school might have wanted to attend college if their circumstances were different. The number of individuals not being reached is, fortunately, less than in the past. Estimates are not conclusive, but the size of the population is much less than that of all low-income or financially needy individuals, which is the primary

standard used for distributing student financial aid.

One might argue that all high-ability individuals regardless of income can attend a community college if desired and that all high-income individuals, regardless of ability, can attend if desired. Furthermore, many individuals with less than high income or ability also are able to attend with the assistance of need-based student financial aid. Consequently, the size of the remaining population that may benefit from additional conventional policies is limited (Anderson and Bowman, 1972). However, while the size of this population may be small as a percentage of the population, the number of individuals involved may be substantial. One analysis suggests that an additional 200,000 individuals with low income and ability would attend college if appropriate aid were available (Doermann, 1978). While any number of estimates could be generated based on various assumptions of individual need and potential interest in postsecondary education, the target of further public policies could be reduced. Whatever resources are available to promote access should be focused more narrowly than they have been in the past.

Determination of the cost-effectiveness of various policies is difficult. Student financial aid programs are among the more easily assessed programs because the mechanism for achieving their end is the distribution of dollars. Nevertheless, estimates have been given of $2,500 (Berne, 1977) and $16,000 (Jackson, 1977) for the cost of inducing an additional individual to attend college through the provision of student financial aid.

For public policy programs that have some other objective,

such as the dissemination of information, estimates are more difficult to obtain. Olivas (1981) reports that the per student cost of Talent Search, a federal project to provide needy youths information and assistance about the availability of student financial aid, is $67. However, the effective cost -- the cost of each youth who decided to attend college because of the information received through Talent Search -- is higher by some unknown amount. No data are given on the number of students who made different decisions than they would have without the information. However, if one were to assume that one in ten were affected, the cost ($670) would still be modest. Outreach, another program designed to identify at the high school level individuals that have potential for college and do attend, is estimated to cost under $500 per individual (California Student Financial Aid Policy Study Group, 1979).

The cost-effectiveness of other strategies are more ambiguous. If high school grade point average (GPA) influences college attendance, what is the method that should be used to raise grade point averages and what is the cost? Just as the determinants of college attendance include a host of policy and nonpolicy variables, so also does high school GPA. Family background and parental aspirations for their children, individual ability and motivation influence GPA as do the quality of instruction and high school curriculum. If quality of instruction and the curriculum can be modified by the level of expenditures for, among other things, salaries paid to teachers, the cost-effectiveness of increasing high school teachers' salaries to

achieve a higher GPA (an example of this type of analysis is Levin, 1968) and presumably greater college attendance might be improved. An issue is how those high school resources should be directed at the individuals for whom it will be most beneficial. Clearly, an empirical resolution of this issue is at least as complex as the issue of student financial aid and probably more difficult because the relationship to college attendance is more distant and less direct.

More empirically conclusive evidence is not needed to take action. A first generation of access has largely been achieved. Now, policy makers are entering a second generation in which efforts should focus more sharply than previously on individuals requiring special assistance, not just financial aid. Although empirical estimates would be useful for evaluating the costs and effectiveness of programs, intuition and the knowledge of existing public policies and educational needs indicate a viable strategy for achieving further access. It should include giving more emphasis to certain individuals earlier through high school counseling, provision of general information about the costs and expected benefits of higher education and tutoring students. As Jackson (1980) says, "[i]f increased resources are devoted to modifying enrollment patterns, then the general implication . . . is that using new tactics -- specialized academic help, financial aid, or information -- will be a wiser choice than relying more heavily on old ones" (p. 19).

For the adult student, three policies might improve adult access without great expenditures of resources.

First, while the importance of distance might suggest establishing more institutions, an alternative is to establish more off-campus sites. Adults who are interested in education are highly motivated and often goal-oriented (Cross, 1981). They have little concern for the instructional setting of a campus, the student union or fellow students, which may be more important for conventional youth. Using high school buildings and other facilities in the community provides the necessary sites and reduces the commuting time for students. Many community colleges are aware of the attractiveness of off-campus instruction for adults, and the rate of off-campus enrollment growth often exceeds that of the campus.

Second, scheduling of classes is an important consideration for adults. With employment responsibilities, adult students find daytime attendance often inconvenient (Hyde and Augenblick, 1980). Offering evening and weekend schedules is more convenient for many adults and adds only slightly to institutional costs. The ultimate in flexible scheduling, correspondence courses or telecommunication courses for home use, are preferred by many.

Finally, the provision of support services probably contributes to the convenience of adult enrollment. For example, Bishop and Van Dyk found that having children had a negative influence on college attendance. Child care provided by institutions, or elsewhere, might offset some of this effect. Another important support service is pre-enrollment counseling for selecting an educational program and for choosing an occupation.

Each of these three policies could be initiated at the

institutional level. A state could also intervene by incorporating into its funding mechanisms provisions that encourage these types of institutional responses to adult needs.

Appendix A

The representation ratios in lines B and C of Table A-1 are the numerators and denominators, respectively, of the ratios shown in line A. (Lines D, E and F show the values used to create the representation ratios.) The reason for the overrepresentation of males and the underrepresentation of females in community colleges in these states is evident from the representation ratios. Not only do men enroll in community colleges more frequently than women, but women enroll in state colleges more frequently than men.

Table A-1

THE COMPOSITION OF REPRESENTATION RATIOS OF BLACKS FOR IOWA, NEBRASKA AND SOUTH CAROLINA

	Iowa		Nebraska		South Carolina	
	males	females	males	females	males	females
A. Ratio of representation ratio for community colleges to the representation ratio for state colleges	1.333	0.500	1.251	0.667	1.451	0.735
B. Representation ratio for community colleges	2.000	0.857	1.333	0.800	1.049	0.850
C. Representation ratio for state colleges	1.500	1.714	1.066	1.200	0.723	1.156
D. Percent minority enrollment, community colleges	1.2	0.6	2.0	1.2	14.8	12.5
E. Percent minority enrollment, state colleges	0.9	1.2	1.6	1.8	10.2	17.0
F. Percent minority population	0.6	0.7	1.5	1.5	14.1	14.7

SOURCE: Compiled from HEGIS reports and 1970 Census data.

Appendix B

Table B-1

AVERAGE TUITION AND FEES, STUDENT BUDGETS AND NET PRICES AT COMMUNITY AND STATE COLLEGES, 1972-73

	Average Tuition and Fees		Average Student Budget		Net Price	
	Community Colleges	State Colleges	Community Colleges	State Colleges	Community Colleges	State Colleges
Alabama	205	445	1221	1963	----	1822
Alaska	200	---	----	----	----	----
Arizona	628	304	1333	1354	----	1177
Arkansas	253	402	1179	1533	1099	1338
California	14	159	1810	1901	1748	1625
Colorado	265	418	1816	2086	1623	1915
Connecticut	264	535	1688	1807	----	1741
Delaware	395	345	----	1375	----	934
Florida	259	557	1603	1879	----	1804
Georgia	335	492	1642	1662	1565	1574
Hawaii	50	---	1493	----	----	----
Idaho	482	354	1626	1977	1477	1865
Illinois	963	579	2241	2129	2117	1800
Indiana	458	655	2248	----	----	----
Iowa	416	600	1667	1536	1607	1385
Kansas	337	432	1305	1570	----	1416
Kentucky	334	366	1350	1354	----	1186
Louisiana	179	296	----	1298	----	1184
Maine	353	---	1178	----	1152	----
Maryland	679	340	1548	1711	1505	1539
Massachusetts	300	330	1777	1899	----	1842
Michigan	505	529	2215	2014	2109	1836
Minnesota	390	458	1742	1728	1650	1470
Mississippi	222	438	911	1474	----	1269
Missouri	881	282	1312	1322	1294	1213
Montana	271	426	1724	1777	----	1520
Nebraska	281	452	1521	1907	1473	1799
Nevada	355	532	----	2858	----	2754
New Hampshire	320	719	1668	2030	1338	1846
New Jersey	705	607	1706	1832	----	1775
New Mexico	395	397	1227	1431	1119	1235
New York	539	665	1841	2270	1695	2048
North Carolina	133	---	1478	----	1419	----
North Dakota	400	401	1305	1533	1252	1371
Ohio	608	658	1646	1864	1589	1772
Oklahoma	270	344	1408	1667	----	1507
Oregon	433	494	1693	2059	1585	1875
Pennsylvania	718	737	1671	1843	1494	1162

Table B-1 (continued)

AVERAGE TUITION AND FEES, STUDENT BUDGETS AND NET PRICES AT COMMUNITY AND STATE COLLEGES, 1972-73

	Average Tuition and Fees		Average Student Budget		Net Price	
	Community Colleges	State Colleges	Community Colleges	State Colleges	Community Colleges	State Colleges
Rhode Island	320	490	970	1879	----	1799
South Carolina	263	470	1952	1874	----	1748
South Dakota	---	433	----	1489	----	1180
Tennessee	189	343	1235	1354	1133	1182
Texas	245	254	1551	1497	1435	1319
Utah	321	401	1692	1515	----	1400
Vermont	827	763	2064	2417	----	2247
Virginia	229	573	1609	1770	----	1674
Washington	247	495	1612	1567	1560	1478
West Virginia	229	266	----	1319	----	1021
Wisconsin	491	536	1530	1856	1437	1836
Wyoming	236	---	1632	----	----	----

NOTE: These data are not considered reliable, especially the net price figures because of the frequently missing or incomplete data on student financial aid.

SOURCE: Compiled from data from HEGIS, the College Board, ECS surveys of state directors of student financial aid programs and other publications on federal student financial aid distributions.

Appendix C

DETERMINANTS OF COMMUNITY COLLEGE ATTENDANCE

The Model of College Attendance

An individual has any number of options that he or she may exercise. All of the options carry different values for that person, and the individual exercises the option that maximizes his or her total welfare. At any point in time, it may be "doing nothing," working, going to college or a combination of these activities. For each individual, certain options have low priorities and are unlikely to be exercised. Given the practical constraints of empirical analysis, models are structured to account for what is thought to be key characteristics and activities. The perpetual question is to what extent do variables in a model represent the actual factors that influence behavior. The model in this analysis attempts to explain an individual's decision to do or not to do some specific thing. The validity of this approach rests upon two assumptions. One is being able to structure an individual's options in a hierarchical order. Berne (1977) and Jackson (1977) have shown that this hierarchy is largely a function of socioeconomic status. Data presented from this analysis also supports this hierarchial structure. As one moves up the hierarchy of work, community college attendance, four-year public college attendance and attendance at some other college or university (excluding community colleges), socioeconomic status rises and high school preparation becomes better. It is assumed that each option carries a probability of

being exercised that is closer in magnitude to the probabilities associated with options contingent to it in the hierarchy than the probabilities associated with more distant options. If the series of options were collapsed to a small number of basic activities, they might include working, attending a community college, attending a four-year college and attending an elite, prestigious university or private institution. According to the concept of hierarchically ordered options, an individual who has a high probability of working will be more likely to attend a community college than any other type of college. Similarly, a person who seriously considers attending an elite college has a small probability of attending a community college or of working.

The second assumption is that the probabilities of exercising less proximate options are close to zero and can be omitted from the analysis without significantly distorting the results. Although this is a simplification of the actual situation, other attempts using conditional logit analysis to recognize the simultaneous, multiple options of an individual do not alter substantially the conclusions that are drawn from the results.

Acceptance of these two assumptions allows examination of two binary choices: (1) the decision to attend a community college or not to attend at all and (2) the decision to attend a community college or some other postsecondary institution. Table C-1 gives the means and standard deviations for the characteristics of individuals in each group. T-values were calculated for the difference between (1) attending a community college and (2) not attending at all and attending another institution.

In this analysis, five sets of factors are identified to explain variation in college attendance. They are individual background characteristics, high school preparation, individual disposition toward and knowledge of postsecondary education, labor market conditions and the individual's higher education environment.

Multivariate linear regression analysis is used to test the significance of variables. Various specifications of dependent and independent variables are used, but each dependent variable is specified as a dichotomous variable.

The Data and Variables

Data are drawn from several sources. The basic source consists of the National Longitudinal Study of the High School Class of 1972 (NLS), surveyed by the National Center for Education Statistics (NCES). Fifty percent of the 22,435 respondents in the NLS were randomly selected for analysis. For each of the 11,356 respondent data records, key variables were extracted from the NLS tapes and additional variables were generated and added to the file. Variables on institutional characteristics were obtained from the Higher Education General Information Survey (HEGIS). Generation of a higher education environment for each individual required computing several hundred thousand distances between individuals and various institutions and then creating variables to describe the characteristics of those institutions. Although more than 11,000 cases were drawn from the NLS tape, the actual number included in the analyses are only a fraction of the initial sample because observations were used only if they had complete

data for all variables. For the older adult analysis, all 23,000 cases were reviewed to obtain an adequate number of respondents who first enrolled in college four years after high school graduation. The residences of the adults were matched with the residences of the conventional college youths, and the higher education environment of the matched youths were used for the adults.

Variable Definitions

Dependent Variables

ACCNATT: 1 if individual attends a community college; 0 if not attending (excluded from analysis if attending an institution other than a community college)

ACCAOTH: 1 if individual attends a community college; 0 if attendance at other institution (excluded from analysis if not attending)

ACCAOTH1: 1 if individual attends a community college; 0 if attendance at a public four-year institution (otherwise excluded from analysis)

ACCAOTH and ACCAOTH1 specify two different ranges on the education hierarchy. ACCAOTH1 is used because the four-year public colleges are viewed as a close substitute for community college attendance for many students. ACCAOTH includes students attending a full spectrum of institutions. ACCNATT was used in the regression analysis that produced the tuition elasticities in the first column of Table 12; ACCAOTH1, for the middle column; and ACCAOTH, for the last column.

Independent Variables

The independent variables are grouped into five sets labeled socioeconomic background, high school preparation, individual

disposition toward higher education, labor market and higher education environment. While a few variables are definitely viewed as nonpolicy variables (socioeconomic background variables being the best example) and others are considered to be clearly within the policy arena of higher education (some of the higher education environment variables for example), most are less clearly defined as either policy or nonpolicy variables and several can be viewed as policy variables in a noneducation arena. An individual's grade point average, for instance, has an important effect on college attendance, but is determined by policy and nonpolicy variables -- individual characteristics, family background, characteristics of the school and characteristics of the student's peers.

For this analysis, individual background characteristics are considered as nonpolicy variables. The high school preparation variables constitute a mixture of nonpolicy variables (such as the college going rate of one's peers) and nonhigher education policy variables (such as grade point average or scholastic aptitude).

The third set of variables is meant to include data on the individual disposition toward and knowledge of higher education. Unfortunately, adequate data on the student's knowledge of postsecondary options and costs were not available. The resulting variables describe the individual's education aspirations, locus of control, self-esteem, work orientation, family orientation and community orientation.

The fourth set of variables includes two labor market variables. One is a measure of average wage rates, and the other

is a measure of the unemployment rate. The wage rate is considered a nonpolicy variable, but the unemployment rate is partially manipulable through work and employment programs.

The fifth set of variables for the higher education environment is composed of two types of variables. One describes the characteristics of community colleges within the individual's own state and within a 30 mile radius of the individual's residence. For each individual, a mean value is calculated for the community colleges in the individual's 30 mile radius. Residence is approximated by the ZIP code of the high school of attendance. Location of the institutions is also by ZIP code. The second type of higher education environment provides similar information for institutions other than community colleges, but two specifications are made. In one specification, all other educational institutions in the individual's state are included in the compilation of the variables to describe the individual's higher education environment. In the other specification the inclusion of other higher education institutions is restricted to those in-state institutions located within 30 miles of the individual and nonselective in their admission standards. This specification generates a higher education environment that more nearly approximates that of the community college environment and presumably represents substitutes that are more plausible for the community college student than are the options included in a higher education environment that includes academically selective and more remote institutions.

Higher education environments were not generated for

individuals who did not have at least one community college and one other type of institution within their area. Consequently, individuals from more remote areas with few institutions were more likely than others to be deleted from the analysis, and therefore the sample represents a more metropolitan sample than the original national sample.

Socioeconomic Background Variables

SES:	an index of socioeconomic status based on father's education, mother's education, parents' income, father's occupation and household items
SEX:	1 if male; 0 if female
WHITE:	1 if white; 0 if other
BLACK:	1 if black; 0 if other

High School Preparation Variables

CGR:	the college going rate of the respondent's classmates
HSA:	1 if high school curriculum is academic; 0 if not academic
HSG:	1 if high school curriculum is general; 0 if not general
GPA:	high school grade point average of the respondent
SAT:	scholastic aptitude test score or equivalent score of respondent

Personal Disposition Variables

COMM:	an index of community orientation
FAM:	an index of family orientation
LOCUS:	an index of locus of control
WORK:	an index of work orientation
CNCPT:	an index of self-esteem

Labor Market Variables

UNEMP: the unemployment rate by state and metropolitan region for 16- to 19-year-olds for the sex of the respondent

WAGE: local average hourly earnings in manufacturing

Community College Environment

All of these variables are based on the number of community colleges within 30 miles of the respondent and within the same state as the respondent.

NUMC: number of community colleges

ENRC: total enrollment

TFC: average tuition and fees

COAC: average student cost of attendance

AIDC: ratio of the number of students given financial aid to the number of full-time undergraduate students

ACTC: average median ACT score of entering freshmen

OCCUPC: ratio of the number of occupational degrees to the number of total degrees of two years or less

HTC: ratio of the number of half-time students to the number of total students

MINC: ratio of the number of minority students to the number of total students

Other College Environment

Sets of variables similar to that for community colleges were generated for other postsecondary institutions. The set based on nonselective other institutions within state and within 30 miles of the individual have the same variable names as for the community colleges, but the last letter is "O" instead of "C." The results in Table 12 are also based on regression analyses in which the other college environment variables are based on nonselective

institutions that are not community colleges but are located in-state and within 30 miles of the individual. The results of the two regressions presented in Table C-5 are derived from other college environment variables based on all institutions within the state that are not community colleges.

Analysis of Policy and Nonpolicy Factors Influencing Community College Attendance

One of the findings of this analysis is that variables important in explaining attendance among those choosing between attending a community college and not attending at all are not necessarily the same variables that explain enrollment behavior when the choice is between attending a community college and a four-year institution. Each of these two situations is examined separately.

Table C-2 gives the mean values and standard deviations of variables used in Table C-2. The standardized regression coefficients (and F-values in parentheses) for 11 regressions are given in Table C-3. Results of the first six regressions are given in column 1. Each of the six sets of variables was entered in a separate regression. Runs 7 through 12 show the results of sequentially combining sets of variables. For example, Run 1 is a regression of the "attend a community college/not attend at all" option on the socioeconomic background variables. Run 2 is a regression of the same choice on high school preparation variables, and Row 7 is a regression of that choice on both the socioeconomic background and high school preparation variables. Run 11 gives the results of using all of the variables.

The most significant variables for influencing community college attendance when the option is not to attend at all are the college going rate of one's peers (CGR) and enrollment in an academic high school curriculum (HSA). To what extent these two variables may be influenced by education policies is dubious. Past analysis shows that high school variables capture much of the explanatory power of background variables (Munroe, 1981). An individual who enrolls in an academic high school curriculum probably already has aspirations and plans for attending college which are formed by his or her family. The college going rate of one's peers also reflects the socioeconomic status of the individual's neighborhood. A comparison of Runs 1 and 7 indicates that SES, which is an important determinant when only background characteristics are entered, loses its significance in Run 7 when high school preparation is included. Essentially CGR and HSA are intermediary variables that capture the influence of SES. This process continues as other sets of variables are included until in Run 11 nearly the full effect of SES is manifested through other variables. This problem of multicollinearity -- the correlation of independent variables -- exists among several of the variables. Resolution of the problem lies with determining the causal relationships that exist among variables.

In 1972, being white made attendance more likely. With the diminution in racial discrimination and the encouragement of minorities to attend college since 1972, the result is probably an overstatement for today's world.

Educational aspirations, expectations and plans are important

determinants of attendance, but there are several drawbacks to using these measures. One is that they become increasingly important as the respondent approaches the time at which attendance begins, if it is to occur. There is a merging of anticipation and actualization. The variable captures the explanatory power of many other variables for family background, high school preparation and other influences (see, for example, Jackson, 1977 and Berne, 1977).

Another drawback is that many of the NLS respondents did not answer questions about educational aspirations, and those that did not answer had disproportionately low socioeconomic status. Consequently, inclusion of such a variable lowers the number of observations available and biases the sample toward a higher socioeconomic status. Finally, the explanatory power of aspirations consists of a combination of policy and nonpolicy variables, and we prefer to view the effect of the more rudimentary variables than derived variables. For these reasons aspirations are excluded from the analysis.

The individual disposition variables do not have much influence on attendance except for community orientation (COMM). Its positive influence on attendance at a community college may reflect the individual's recognition that a more educated person is able to contribute more to his or her community.

College administrators, especially community college administrators, claim that enrollments are quite sensitive to the unemployment rate. In addition, several studies indicate that enrollments will rise when unemployment rises (see, for example,

Corrazzini, et al. 1972 and Crean, 1973). However, the measured effect of employment opportunities or the opportunity to earn income on attendance is ambiguous. On the one hand, if unemployment is high and wages are low foregone earnings are less and therefore individuals may be more disposed to enroll. On the other hand, if wages are high and unemployment is low foregone earnings are higher but income is likely to be higher and more individuals may be able to afford to enroll. The result often is that average wages, as a measure of foregone earnings, reveal only a weak influence on attendance (see, for example, Hopkins, 1974). The results in Table B-3 also yield insignificant coefficients. The unemployment rate (UNEMP), however, when entered only with the WAGE variable has a significant positive effect, but it is lost when the community college environment variables are entered. Several of the community college environment variables have moderately high correlations with UNEMP although no clear explanation for the correlations exist except that it may be due to an underlying metropolitan phenomenon. Multicollinearity arises again among the higher education environment variables. Consequently, the influence of variables must be viewed together since the influential variable may shift from one specification to another simply because of this statistical artifact. For example, the percentage of students in occupational programs at community colleges (OCCUPC) had in 1972 (when community colleges were largely oriented to the academic transfer activity) a negative influence on community college attendance (see Run 10). When the comparable set of variables for other institutions is introduced

in Run 11, the variable for the percentage of students in occupational programs at other institutions (OCCUPO), which is more highly correlated with the dependent variable than is OCCUPC, captures the variation in attendance that could be statistically explained by either of the two variables. Even though OCCUPC and OCCUPO have a moderately high positive correlation, OCCUPC appears to explain nothing in Run 11 while OCCUPO (a variable for other higher education institutions that is not even on option for the individual given the structure of the dependent variable to attend a community college or not to attend at all) appears to exert an influence. Consequently, one set of higher education environment variables should be examined with the other set in mind as well.

The number of students and the number of colleges have a negligible to moderate effect on attendance. In Run 10, it is shown that in areas with large community college enrollments an individual is not more likely to attend a community college nor does the number of community colleges have a significant effect on attendance. (If the sample represented less urban areas, the importance of the number of institutions might increase.) In Run 11, the results suggest that a large number of other institutions (NUMO) results in more individuals, who are deciding to attend a community college or not to attend at all, choosing not to attend. The interpretation is slightly convoluted, but an area that is dominated by other institutions may make the community college option less visible and perhaps less viable. A large number of community colleges (NUMC) in contrast (and as expected) raises the prospects of attendance although community college enrollments

(ENRC), which when controlled for the number of colleges approximates a measure for size, have a slight negative effect on attendance.

Interpretation of the results of the regressions of "attend community college or attend other college" are given in Table C-4. Interpretation, especially for the higher education environment for other institutions, is more straightforward than was the case for the regression results presented in Table C-3.

Table C-5 gives the results of the 11th regression runs in Tables C-3 and C-4 with variables for distance to the nearest community college (DISTC) and distance to the nearest other college (DISTO) included. The category of variables "other college environment" is based on in-state institutions that are not community colleges. This specification is broader than that used in Tables C-3 and C-4, which is restricted to in-state nonselective institutions within 30 miles of the individual. The specification in this table includes a wider range of tuition because it includes elite private institutions and public universities which usually have higher tuition levels. The effect is that it allows the tuition and student cost variables to be more significant than they would be if the range were more limited. The distance variable, however, should not be affected by the change in the way in which the "other college environment" is defined, because beyond about 30 miles commuting becomes improbable.

Table C-1

STATISTICS OF SELECTED VARIABLES FOR INDIVIDUALS NOT ATTENDING COLLEGE AND FOR INDIVIDUALS ATTENDING DIFFERENT INSTITUTIONAL SECTORS

	Attend Community College			Not Attend				Attend Public Four-Year				Attend Any Other[1]			
	X	SD	N	X	SD	N	T-VALUE	X	SD	N	T-VALUE	X	SD	N	T-VALUE
SES	.029	.665	1364	-.274	.637	6358	15.4	.144	.707	1247	-4.3	.342	.751	2078	-12.8
SEX	.513	.500	1366	.492	.500	6521	1.4	.478	.500	1252	1.8	.506	.500	2085	0.4
WHITE	.778	.416	1359	.735	.441	6467	3.4	.786	.410	1251	-0.5	.840	.367	2077	-4.5
BLACK	.100	.300	1359	.156	.363	6467	6.0	.153	.360	1251	-4.1	.106	.308	2077	-0.6
CGR	.247	.137	1366	.200	.124	6574	11.7	.232	.142	1252	2.7	.256	.144	2086	-1.8
HSA	.447	.497	1366	.221	.415	6552	15.7	.669	.471	1252	1.3	.726	.446	2084	-16.8
HSG	.373	.484	1366	.444	.497	6552	-4.9	.267	.442	1252	5.9	.199	.399	2084	11.0
GPA	48.5	26.3	1131	40.6	25.8	5420	9.2	61.6	24.5	1013	-11.9	63.9	25.3	1776	-15.6
SAT	805	201	1166	738	205	1625	8.6	891	211	1142	-10.0	955	221	1896	-19.3
COMM	2.15	.463	1026	2.13	.449	4796	1.3	2.16	.449	909	-0.5	2.13	.483	1595	0.9
FAM	.963	.439	1029	.919	.451	4796	2.9	.941	.423	908	1.1	.911	.419	1594	2.5
LOCUS	3.78	.684	1029	3.58	.761	4789	8.3	3.91	.633	907	-4.3	3.99	.662	1595	-7.8
WORK	2.55	.349	1028	2.53	.361	4801	1.7	2.53	.350	909	1.3	2.49	.370	1595	4.2
CNCPT	2.07	.654	1028	2.12	.657	4800	-2.2	2.05	.664	908	0.7	1.97	.621	1595	3.9

NOTE: A t-value of 1.6 or more indicates a significance level of .95; a value of 2.3 indicates a significance level of .99.

[1]Includes public four-year institutions.

Table C-2

MEANS AND STANDARD DEVIATIONS OF VARIABLES USED IN REGRESSION ANALYSES OF CHOICE TO ATTEND COMMUNITY COLLEGE OR NOT TO ATTEND

Variable	Mean	Standard Deviation
ACCNATT	.2132	.4098
SES	-.1986	.6527
SEX	.4970	.5003
WHITE	.7006	.4583
BLACK	.1437	.3510
CGR	.2561	.1513
HSA	.3293	.4703
HSG	.3545	.4786
GPA	41.9829	26.1595
SAT	741.0970	194.8234
COMM	2.1483	.4436
FAM	.9327	.4424
LOCUS	3.6349	.7692
WORK	2.5268	.3604
CNCPT	2.0831	.6768
UNEMP	10.3946	2.6701
WAGE	3.9377	.4664
NUMC	7.4862	6.1893
ENRC	88775.5581	115020.5663
TFC	357.0012	222.2813
COAC	2206.8970	311.0469
AIDC	.1808	.1424
ACTC	19.0774	1.3971
OCCUPC	.6223	.1768
HTC	.3942	.1214
MINC	.2604	.1346
NUMO	27.1078	30.0896
ENRO	23246.0970	23345.6956
TFO	989.5150	492.7916
COAO	2864.1533	550.9357
AIDO	.2796	.1514
ACTO	17.4220	2.2994
OCCUPO	.8101	.2486
HTO	.1799	.0917
MINO	.3507	.2258

Table C-3

REGRESSIONS OF COMMUNITY COLLEGE ATTENDANCE
(dependent variable: attend community college/not attend at all)

Socio-Economic Background	Runs 1-6		Run 7		Run 8		Run 9		Run 10		Run 11	
SES	.11	(7.6)	.04	(0.8)	.04	(1.2)	.05	(1.4)	.03	(0.4)	.01	(0.0)
SEX	N/C	N/C	.01	(0.1)	.02	(0.2)	-.01	(0.1)	-.01	(0.1)	-.01	(0.1)
WHITE	.03	(0.5)	.05	(1.1)	.05	(1.3)	.06	(2.5)	.07	(2.7)	.07	(2.0)
BLACK	.01	(0.1)	.03	(0.3)	.02	(0.1)	N/C	N/C	N/C	N/C	.01	(0.1)
	R^2 = .014											
High School Preparation												
CGR	.15	(18.9)	.15	(17.4)	.16	(18.9)	.16	(20.3)	.17	(19.2)	.17	(16.9)
HSA	.14	(10.1)	.13	(8.8)	.12	(7.7)	.12	(7.7)	.13	(8.7)	.13	(8.9)
HSG	.08	(4.1)	.08	(3.8)	.08	(3.7)	.05	(1.5)	.04	(1.1)	.05	(1.3)
GPA	.07	(3.4)	.08	(4.1)	.07	(3.1)	.05	(1.9)	.02	(0.3)	.01	(0.1)
SAT	.04	(0.9)	.01	(0.1)	.02	(0.3)	.03	(0.4)	.04	(0.9)	.06	(1.6)
	R^2 = .055											
Individual Disposition												
COMM	.06	(3.2)			.09	(6.5)	.08	(5.2)	.09	(5.6)	.08	(4.8)
FAM	.03	(0.5)			.05	(1.7)	.05	(2.0)	.05	(1.7)	.04	(1.2)
LOCUS	.08	(5.7)			.02	(0.4)	.02	(0.2)	.01	(0.1)	.02	(0.2)
WORK	-.03	(0.7)			-.01	(0.1)	-.01	(0.1)	-.01	(0.1)	N/C	N/C
CNCPT	-.00	(0.1)			N/C	N/C	N/C	N/C	-0.1	(0.0)	N/C	N/C
	R^2 = .012											
Labor Market Conditions												
UNEMP	.09	(7.4)					.12	(10.1)	.06	(1.2)	.05	(0.6)
WAGE	-.00	(0.0)					-.05	(1.6)	-.04	(0.5)	-.02	(0.1)
	R^2 = .009											

Table C-3 (Continued)

REGRESSIONS OF COMMUNITY COLLEGE ATTENDANCE
(dependent variable: attend community college/not attend at all)

	Runs 1-6		Run 7	Run 8	Run 9	Run 10		Run 11	
Community College Environment									
NUMC	-.03	(0.0)				-.04	(0.1)	.41	(1.8)
ENRC	.13	(0.6)				.14	(0.5)	-.45	(1.6)
TFC	-.01	(0.1)				-.02	(0.1)	.03	(0.0)
COAC	-.04	(1.0)				-.03	(0.5)	-0.6	(1.1)
AIDC	-.04	(0.8)				-.01	(0.0)	-.08	(0.8)
ACTC	-.05	(1.2)				-.08	(3.0)	-.06	(1.5)
OCCUPC	-.11	(5.6)				-.09	(4.0)	.01	(0.0)
HTC	-.01	(0.1)				-.01	(0.0)	.00	(0.0)
MINC	-.04	(0.9)				-.06	(1.7)	-.01	(0.0)
	R^2 = .036								
Other College Environment									
NUMO	-.26	(3.9)						-.47	(5.1)
ENRO	.13	(1.0)						.23	(1.4)
TFO	.21	(2.6)						.25	(2.3)
COAO	-.07	(0.9)						-.04	(0.1)
AIDO	.02	(0.2)						.01	(0.0)
ACTO	.10	(3.5)						.08	(1.3)
OCCUPO	.18	(6.3)						-.17	(3.1)
HTO	.06	(1.2)						.10	(1.5)
MINO	.07	(2.1)						-.07	(0.9)
	R^2 = .051								
R^2			.058	.069	.081	.107		.127	

NOTE: Values are standardized coefficients with F-values given in parentheses. An F-value of 1.5 indicates a significance level of .95; an F-value of 1.7 indicates a significance level of .99. The regressions are based on 835 observations.

The variables under the category "other college environment" are based on nonselective institutions that are not community colleges but that are located in-state and within 30 miles of the individual.

Table C-4

REGRESSIONS OF COMMUNITY COLLEGE ATTENDANCE
(dependent variable: attend community college/
attend public four-year institution)

Socio-Economic Background	Runs 1-6		Run 7		Run 8		Run 9		Run 10		Run 11	
SES	.15	(6.4)	-.07	(1.4)	-.08	(1.8)	-.10	(2.7)	-.16	(8.1)	-.17	(8.7)
SEX	.01	(0.0)	-.01	(0.0)	.01	(0.0)	-.02	(0.1)	N/C	N/C	.02	(0.1)
WHITE	.05	(0.4)	.09	(1.7)	.09	(1.5)	.10	(1.9)	.12	(2.7)	.12	(2.7)
BLACK	-.03	(0.2)	-.06	(0.7)	-.05	(0.6)	-.05	(0.6)	-.06	(0.8)	-.05	(0.6)
	R^2 = .019											
High School Preparation												
CGR	.04	(0.5)	.03	(0.3)	.03	(0.4)	.04	(0.5)	.10	(3.3)	.12	(3.8)
HSA	-.25	(10.8)	-.25	(10.4)	-.25	(10.6)	-.24	(9.4)	-.19	(7.0)	-.18	(6.3)
HSG	-.04	(0.4)	-.04	(0.4)	-.05	(0.4)	-.06	(0.6)	-.04	(0.3)	-.03	(0.2)
GPA	-.19	(11.9)	-.18	(9.7)	-.19	(10.0)	-.20	(11.3)	-.26	(23.5)	-.26	(21.9)
SAT	-.10	(2.7)	-.13	(4.2)	-.16	(5.0)	-.16	(5.1)	-.10	(2.5)	-.08	(1.4)
	R^2 = .144											
Individual Disposition												
COMM	.06	(1.2)			.05	(0.8)	.05	(0.8)	.05	(1.0)	.04	(0.7)
FAM	-.01	(0.0)			-.03	(0.4)	-.03	(0.4)	-.04	(0.5)	-.04	(0.6)
LOCUS	-.08	(2.0)			.05	(0.7)	.05	(0.7)	.07	(1.8)	.07	(1.8)
WORK	-.04	(0.6)			-.08	(2.1)	-.08	(2.4)	-.04	(0.7)	-.04	(0.6)
CONCPT	.01	(0.0)			-.01	(0.1)	-.01	(0.0)	-.01	(0.0)	N/C	N/C
	R^2 = .011											
Labor Market Conditions												
UNEMP	.10	(3.3)					.10	(3.5)	-.01	(0.0)	N/C	N/C
WAGE	.01	(0.0)					.04	(0.6)	-.03	(0.2)	-.05	(0.3)
	R^2 = .010											

Table C-4 (Continued)

REGRESSIONS OF COMMUNITY COLLEGE ATTENDANCE
(dependent variable: attend community college/
attend public four-year institution)

	Runs 1-6		Run 7	Run 8	Run 9	Run 10		Run 11	
Community College Environment									
NUMC	-.24	(1.2)				-.54	(5.2)	-.21	(0.2)
ENRC	.33	(1.8)				.76	(7.9)	.47	(0.9)
TFC	.01	(0.0)				.04	(0.1)	.00	(0.0)
COAC	-.10	(3.1)				-.06	(0.8)	-.11	(2.2)
AIDC	.02	(0.1)				.07	(1.3)	-.05	(0.2)
ACTC	-.11	(2.3)				-.10	(2.1)	-.05	(0.5)
OCCUPC	-.31	(18.3)				-.23	(10.1)	-.12	(1.6)
HTC	.02	(0.0)				-.01	(0.0)	M/C	M/C
MINC	-.08	(1.6)				-.20	(9.2)	-.07	(2.1)
	R^2 = .125								
Other College Environment									
NUMO	-.78	(13.1)						-.44	(1.7)
ENRO	.40	(4.5)						.02	(0.0)
TFO	.65	(10.3)						.46	(3.8)
COAO	-.15	(2.0)						-.05	(0.1)
AIDO	.10	(1.8)						.05	(0.4)
ACTO	.17	(5.6)						.05	(0.4)
OCCUPO	-.16	(3.0)						-.05	(0.3)
HTO	.21	(5.7)						.21	(3.4)
MINO	-.09	(1.5)						-.11	(1.1)
	R^2 = .129								
R^2			.159	.169	.180	.300		.334	

NOTE: Values are standardized coefficients with F-values given in parentheses. An F-value of 1.5 indicates a significance level of .95; an F-value of 1.7 indicates a significance value of .99. The regressions are based on 346 observations.

The variables under the category "other college environment" are based on nonselective institutions that are not community colleges but that are located in-state within 30 miles of the individual.

Table C-5

REGRESSIONS OF COMMUNITY COLLEGE
ATTENDANCE INCLUDING DISTANCE VARIABLES

Socio-Economic Background	Dependent Variable: Attend Community College/Not Attend		Dependent Variable: Attend Community College/Attend Other	
SES	.01	(0.1)	-.17	(14.7)
SEX	-.01	(0.0)	-.01	(0.0)
WHITE	.07	(2.1)	.05	(0.8)
BLACK	.01	(0.1)	-.10	(3.7)
High School Preparation				
CGR	.14	(12.0)	.01	(0.1)
HSA	.13	(9.2)	-.17	(16.7)
HSG	.05	(1.5)	N/C	N/C
GPA	.02	(0.2)	-.22	(23.7)
SAT	.04	(0.9)	-.09	(2.9)
Individual Disposition				
COMM	.08	(5.5)	.02	(0.2)
FAM	.04	(1.4)	-.00	(0.0)
LOCUS	.01	(0.1)	.05	(1.5)
WORK	-.01	(0.0)	.00	(0.0)
CNCPT	-.01	(0.1)	-.02	(0.2)
Labor Market Conditions				
UNEMP	.02	(0.2)	-.06	(1.0)
WAGE	-.01	(0.0)	-.02	(0.1)
Community College Environment				
NUMC	-.27	(0.8)	-.77	(7.2)
ENRC	.04	(0.1)	.60	(2.9)
TFC	.09	(0.2)	.17	(0.7)
COAC	-.05	(1.1)	-.14	(5.9)
AIDC	N/C	N/C	-.04	(0.2)
ACTC	-.11	(3.7)	-.16	(6.6)
OCCUPC	-.04	(2.4)	-.11	(2.0)
HTC	-.02	(0.8)	.12	(2.9)
MINC	N/C	N/C	.02	(0.1)
DISTC	-.11	(3.9)	-.11	(4.4)

Table C-5 (continued)

REGRESSIONS OF COMMUNITY COLLEGE
ATTENDANCE INCLUDING DISTANCE VARIABLES

	Dependent Variable: Attend Community College/Not Attend		Dependent Variable: Attend Community College/Attend Other	
Other College Environment				
NUMO	.03	(0.0)	.06	(0.1)
ENRO	-.07	(0.1)	-.36	(1.4)
TFO	-.28	(0.7)	-.51	(1.3)
COAO	.32	(2.8)	.56	(3.4)
AIDO	-.03	(0.1)	.00	(0.0)
ACTO	-.02	(0.0)	.13	(0.4)
OCCUPO	-.27	(2.4)	-.29	(1.8)
HTO	-.25	(2.5)	-.27	(1.1)
MINO	.00	(0.0)	.07	(0.4)
DISTO	.01	(0.0)	.04	(0.5)

NOTE: Values are standardized coefficients with F-values given in parentheses. An F-value of 1.5 indicates a significance level of .95; an F-value of 1.7 indicates a significance value of .99. The regressions are based on 346 observations.

N/C means that no value was computed.

The community college environment variables are based on institutions located in-state and within 30 miles of the individual. The other college environment variables are based on institutions located within the state of the individual.

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